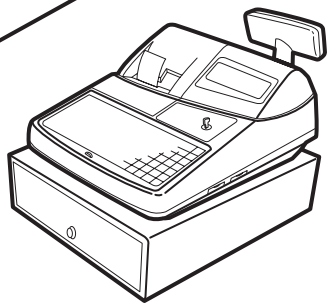
SHARP SERVICE MANUAL

CODE : 00ZERA410USME

ER-A410



ER-A420

ELECTRONIC CASH REGISTER

MODEL ER-A410 ER-A420

SRV KEY : LKGIM7113RCZZ
PRINTER : PR-45M II
(U, A version)

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PARTS GUIDE

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CAUTIONS

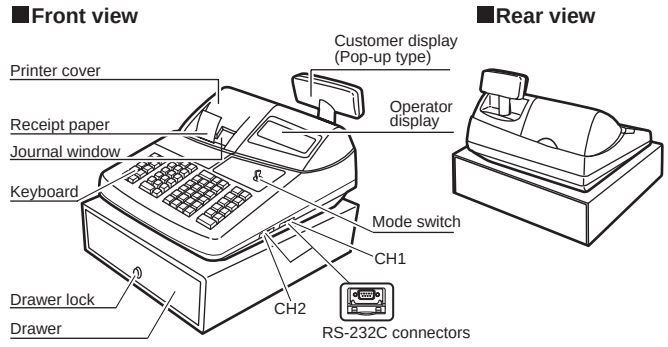
THERE IS A RISK OF EXPLOSION IF THE BATTERY
IS REPLACED BY AN INCORRECT TYPE.
PROPERLY DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS.

WHEN CONNECTING THE 40PIN FLAT CABLE
BETWEEN THE MAIN PWB
AND THE KEY PWB, CAREFULLY INSERT THE
CABLE INTO CONNECTOR OPENING.

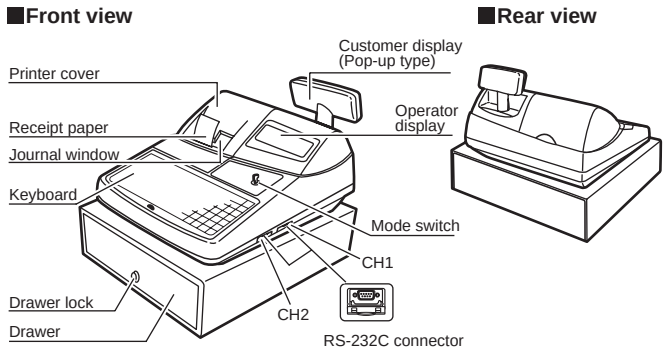
CHAPTER 1. SPECIFICATIONS

1. APPEARANCE

ER-A410



ER-A420



2. RATING

Model	ER-A410/420
Weight	13.2kg (29.1lbs)
Dimensions	420 (W) x 427 (D) x 297 (H) mm 16.5 (W) x 16.8 (D) x 11.7 (H) inch
Power source	120V ±10%, AC 60Hz
Power consumption	Stand-by 9W, Operating 46.5W (max.)
Working temperature	0°C~40°C (32°F to 104°F)

3. KEYBOARD

3-1. KEYBOARD LAYOUT

ER-A410

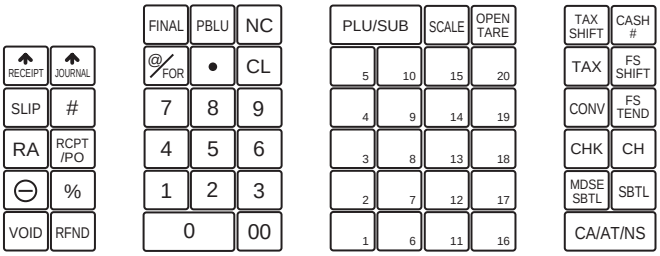
Type	Normal keyboard
Key stroke	3.5 ± 0.5 mm
Key pitch	19 (W) x 19 (H) mm

ER-A420

Type	Flat key
Key stroke	0.8 ± 0.2 mm
Key pitch	18 (W) x 15 (H) mm

3-2. KEY LAYOUT

ER-A410 KEYLAYOUT



Note: All the keys except the receipt paper feed and journal paper feed keys can be re-positioned.

■**Key names**

↑ RECEIPT	Receipt paper feed key
↑ JOURNAL	Journal paper feed key
0 ~ 9, 00	Numeric keys
•	Decimal point key
@/FOR	Multiplication key
CL	Clear key
1 ~ 20	Department keys
PLU/SUB	Price lookup/subdepartment key
SCALE	Scale key
OPEN TARE	Open tare key
CASH #	Cashier code entry key
⊖	Discount 1 key
%	Percent 1 key
TAX	Tax key
TAX SHIFT	Tax 1 shift key
FS SHIFT	Food stamp shift key
FS TEND	Food stamp tendered key
CHK	Check 1 key
CH	Charge 1 key
SBTL	Subtotal key
CA/AT/NS	Cash/Amount tendered and No-sale key
VOID	Void key
RFND	Refund key
RA	Received-on-account 1 key
RCPT/PO	Receipt print/copy and Paid-out 1 key
MDSE SBTL	Merchandise subtotal key
#	Non-add code key
NC	New charge account balance key
PBLU	Previous balance key
FINAL	Final key
CONV	Conversion 1 key
SLIP	Slip print key

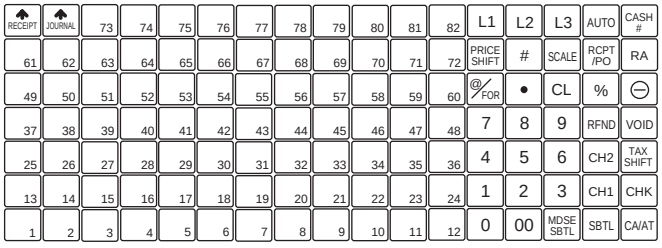
■ **Optional keys**

SRVC	Service key
%2 ~ %4	Percent 2 thru 4 keys
AUTO ~ AUTO 5	Automatic sequencing 1 thru 5 keys
CA2	Cash total 2 key
BIRTH	Birthday date entry key
DEPT #	Department code entry key
RA2	Received-on-account 2 key
PO2	Paid-out 2 key
CONV2 ~ CONV4	Conversion 2 thru 4 keys
CH2 ~ CH5	Charge 2 thru 5 keys
CHK2	Check 2 key
DEPO	Deposit entry key
DEPO RFND	Deposit refund key
TRAY SBTL	Tray subtotal key
RFUND SALE	Refund sale key
PRINT	Validation print key
L1 ~ L3	PLU level shift 1 thru 3 keys
PRICE SHIFT	Price level shift key
⊖2 ~ ⊖4	Discount 2 thru 4 keys
000	Triple zero entry key
TAX2 SHIFT ~ TAX4 SHIFT	Tax 2 thru 4 shift keys
NS	No sale key

Caution:

- The [RCPT/PO] is a double-function key ([Receipt function] and [Paid-out function]).
  Press the [RCPT/PO] key for either the [RCPT] or [PO] key in the described operations.
- The [CA/AT/NS] is a double-function key ([Cash/Amount tendered function] and [No Sale function]).
  Press the [CA/AT/NS] key for either the [CA/AT] or [NS] key in the described operations.

ER-A420 KEYLAYOUT



Note: All the keys except the receipt paper feed and journal paper feed keys can be re-positioned.

■ **Key names**

↑ RECEIPT	Receipt paper feed key
↑ JOURNAL	Journal paper feed key
0 ~ 9, 00	Numeric keys
•	Decimal point key
@/FOR	Multiplication key
CL	Clear key
SCALE	Scale key
TAX SHIFT	Tax 1 shift key
CA/AT	Cash/Amount tendered key
SBTL	Subtotal key
MDSE SBTL	Merchandise subtotal key

CASH#	Chasier code entry key
⊖	Discount 1 key
#	Non-add code key
%	Percent 1 key
L1 ~ L3	PLU level shift 1 thru 3 keys
CH1, CH2	Charge 1 and 2 keys
CHK	Check 1 key
VOID	Void key
RFND	Refund key
RA	Received-on-account 1 key
RCPT/PO	Receipt and Paid-out 1 key
PRICE SHIFT	Price level shift key
AUTO	Automatic sequencing 1 key
1 ~ 82	Direct price lookup keys

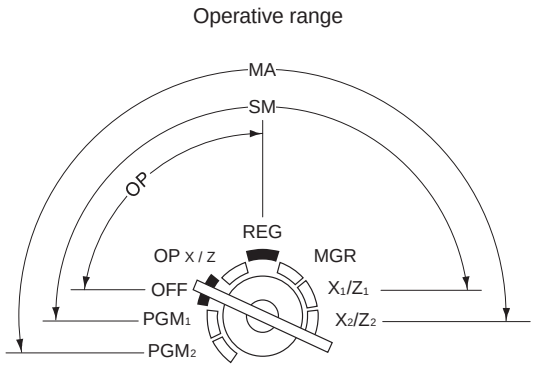
■ **Optional keys**

SRVC	Service key
%2 ~ %4	Percent 2 thru 4 keys
AUTO 2 ~ AUTO 5	Automatic sequencing 2 thru 5 keys
CA2	Cash total 2 key
BIRTH	Birthday date entry key
DEPT#	Department code entry key
RA2	Received-on-account 2 key
PO2	Paid-out 2 key
NS	No sale key
OPEN TARE	Open tare key
CONV ~ CONV4	Conversion 1 thru 4 keys
CH3 ~ CH5	Charge 3 thru 5 keys
CHK2	Check 2 key
DEPO	Deposit entry key
DEPO RFND	Deposit refund key
TRAY SBTL	Tray subtotal key
RFND SALE	Refund sale key
PRINT	Validation print key
PLU/SUB	Price lookup/subdepartment key
FINAL	Final key
SLIP	Slip print key
TAX	Tax key
FS SHIFT	Food stamp shift key
FS TEND	Food stamp tendered key
⊖2 ~ ⊖4	Discount 2 thru 4 keys
000	Triple zero entry key
TAX2 SHIFT ~ TAX4 SHIFT	Tax 2 thru 4 shift keys
PBLU	Previous balance key
NC	New charge account balance key

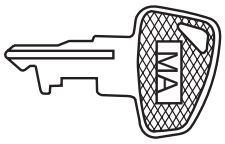
Note: The direct department and/or PLU keys can be expanded.

4. MODE SWITCH

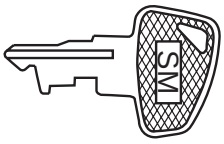
4-1. MODE SWITCH AND MODE KEYS



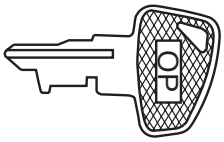
• Manager key (MA)



• Submanager key (SM)



• Operator key (OP)



The mode switch has these settings:

OFF: This mode locks all register operations.
No changes may occur to register data.

OP X/Z: This setting allows cashiers to take an X or Z reports for their sales information. This mode can also be used for displaying the date/time and printing the employee's arrival/departure times. This mode can be also used to toggle receipt state "ON" and "OFF" by pressing the [RCPT] key. (To utilize this function, the register must be programmed for "OP X/Z mode available" in the PGM2 mode.)

REG: For entering sales

PGM1: To program those items that need to be changed often: e.g., unit prices of departments or PLUs, and percentages.

PGM2: To program all PGM1 programs and those items that do not require frequent changes: e.g., date, time, or a variety of register functions.

MGR: For manager's and submanager's entries
The manager can use this mode to make entries that are not permitted to be made by cashiers in the REG mode.
– for example, after-transaction voiding and override entries.

X1/Z1: To take the X/Z reports for various daily totals.

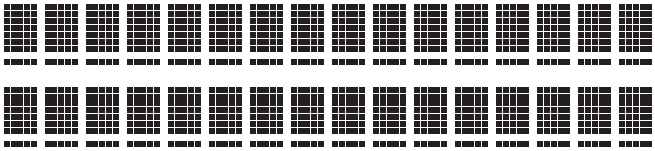
X2/Z2: To take the X/Z reports for various periodic (weekly or monthly) consolidation of totals.

5. DISPLAY

5-1. OPERATOR DISPLAY

Display device:	LCD
Number of lines:	2 lines
Number of positions:	16 positions
Color of display:	Yellow / Green
Character font:	5 x 7 dot
Character size:	4.84 (W) x 8.06 (H) mm

Layout:



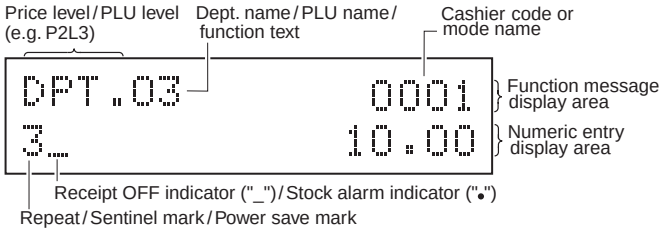
5-2. CUSTOMER DISPLAY

Display device:	LED
Number of lines:	1 line
Number of positions:	7 positions
Color of display:	Yellow / Green
Style:	Pop up type
Character form:	7 segment + Dp
Character size:	14.2mm (H) x 7.9mm (W)

Layout:

■Operator display

The operator display consists of a two-line dot-matrix display (16 characters/line).


Price level / PLU level (e.g. P2L3)
Dept. name / PLU name / function text
Cashier code or mode name
DPT.03
0001
3_
10.00
Function message display area
Numeric entry display area
Receipt OFF indicator ("_") / Stock alarm indicator ("•")
Repeat / Sentinel mark / Power save mark

- Cashier code or mode displayed

  The mode that the key is placed in is displayed. When a cashier is assigned, the cashier code is displayed in the REG or OP X/Z mode. For example, “0001” is displayed when the cashier 0001 is assigned.

- Repeat

  The number of repeats is displayed, starting at "2" and increments with each repeat. When you have registered ten times, the display will show "0". (2 → 3.....9 → 0 → 1 → 2...)

- Sentinel mark

  When amounts in the drawer reaches the amount you preprogrammed, the sentinel mark "X" is displayed to advice you to remove the money and take it to a safe place.

- Power save mark

  When the cash register goes into the power save mode, the power save mark (decimal point) is displayed.

- Stock alarm indicator

  When the stock of the PLU which has been entered is zero or negative, the alarm indicator (decimal point) is displayed.

- Function message display area

  Item labels of Departments PLU/subdepartments and function text you use, such as %1, (–) and CASH are displayed here. For the details of function texts, please refer to pages 112 and 113.
  When an amount entry is required, “- - - - - - -” is displayed in the numeric entry display area with "AMOUNT". When a preset price has been set, the price is displayed in the numeric entry display area as the "AMOUNT".

- Numeric entry display area

  Numbers entered using numeric keys are displayed here.

Date and time display

The Date and time appear on the display in the OP X/Z, REG, or MGR mode. In the REG or MGR mode, press the [#] key to display the date and time.

Error messages

When an error occurs, the corresponding error message is displayed in the function message display area.

■Customer display (Pop-up type)

$——(• : Appears right below the seventh place when the item amount is displayed at scale entry.)

6. PRINTER

6-1. PRINTER

• Part number:	PR-45M II (PR-45M compatible)	
• NO. of stations:	2 (Receipt and journal)	
• Validation:	No	
• Printing system:	Line thermal	
• No. of dots:	Receipt	288 dots
• Journal		288 dots
• Dot pitch:	Horizontal	0.125mm
	Vertical	0.125mm
• Font:	font A: 12 dots x 24 dots	
	font B: 9 dots x 24dots	
• Printing capacity:	Receipt	max. 24 characters
	Journal	max. 24 characters
• Character size:	1.5mm (W) x 3.0mm (H) at 12 x 24 dots	
	1.125mm (W) x 3.0mm (H) at 9 x 24 dots	
• Print pitch:	Column distance	1.5mm at 12 dots
		1.125mm at 9 dots
	Row distance	3.75mm
• Print speed:	Approximate 50mm/s	
• Paper feed speed: (Manual feed)	Approximate 40mm/s	
• Reliability:	Mechanism MCBF 5 million lines	
• Paper end sensor:	Optional (Receipt and journal)	
• Cutter:	Manual	
• Near end sensor:	No	

Note : The PR-45M II has a minor change over the model of the PR-45M. This printer does not include the gear cover (GCOVH7146BHZZ) which is for the PR-45M only.

6-2. PAPER

- Paper roll dimension: 44.5 ± 0.5mm in width
  Max. 83mm in diameter
- Paper quality: (Journal/Receipt)
  High-quality paper
  paper thickness: 0.06 to 0.08mm

6-3. LOGO STAMP

- The Graphic type Logo is used

6-4. CUTTER

- Method: Manual

7. DRAWER

[OUTLINE]

- Standard equipment: Yes
- Max. number of additional drawers: 1
- The drawer consists of:
  1) Drawer box (outer case) and drawer
  2) Money case
  3) Lock (attached to the drawer)

[SPECIFICATION]

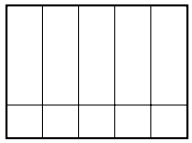
7-1. DRAWER BOX AND DRAWER

Model name of the drawer box	SK423
Size	420 (W) x 427 (D) x 112 (H) mm
color	Gray 368
Material	Metal
Bell	–
Release lever	Standard equipment: attached to the bottom
Drawer open sensor	YES

7-2. MONEY CASE

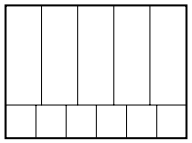
	For U version	For A version
Separation from the drawer	Allowed	Allowed
Separation of the coin compartments from the money case	Disallowed	Allowed
Bill separator	No	No
Number of compartments	5B/5C	5B/6C

For U version



5B/5C

For A version



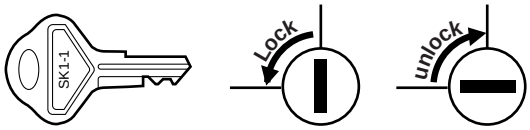
5B/6C

7-3. LOCK (LOCK KEY: LKGIM7331BHZZ)

- Location of the lock: Front
- Method of locking and unlocking:

  To lock, insert the drawer lock key into the lock and turn it 90 degrees counter clockwise.
  To unlock, insert the drawer lock key and turn it 90 degrees clockwise.

Key No: SK1-1



CHAPTER 2. OPTIONS

1. OPTIONS

NO	CLASSIFICATION	COMPONENT NAME	MODEL NAME	REMARK
1	Drawer	Remote drawer	ER-03DW	
			ER-04DW	
2	Key kit	1 x 1 key top kit	ER-11KT7	
		1 x 2 key top kit	ER-12KT7	
		2 x 2 key top kit	ER-22KT7	
		1 x 1 dummy key kit	ER-11DK7G	
		5 x 1 dummy key kit	ER-51DK7G	

2. SERVICE OPTIONS

NO	NAME	PARTS CODE	PRICE RANK	REMARK
1	SRV key	LKGiM7113RCZZ	AK	
2	Water proof switch cover	GCŌVH2541BHZB	AY	
3	Water proof keyboard cover	GCŌVH2541BHZA	BC	For ER-A410
4	Text preset key cover	GCŌVH2541BHSB	BD	For ER-A410
5	Blank sheet	PSHEK3008BHZZ	AL	For ER-A420

3. SUPPLIES

NO	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	Thermal roll paper	TPAPR6645RC05	BA	5 ROLLS/PACK

4. SPECIAL SERVICE TOOLS

NO	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	RS-232 Loop-back connector	UKOG-6705RCZZ	BU	

CHAPTER 3. MASTER RESET AND PROGRAM RESET

The SRV key is used for performing entries in the SRV mode.

A MASTER RESET clears the entire memory and resumes initial values.

A PROGRAM RESET resumes the initial program without clearing the memory.

There are 2 kinds of MASTER RESET operations.

MASTER RESET 1: Normal MASTER RESET
Clears the entire memory and resumes initial values.

MASTER RESET 2: It enables the layout of fixed keys in addition to MASTER RESET 1.

Fixed keys: [0] [1] [2] [3] [4] [5] [6] [7] [8] [9] [00] [000] [.] [CL] [@/FOR] [SBTL] [CA/AT]

1. MASTER RESET 1

Please use “Procedure A” or “Procedure B”

Procedure A: 1) Set the mode switch to the (SRV’) position.
2) Plug in the AC power cord to the wall outlet.
3) While holding down the JOURNAL FEED key, turn the mode switch to (SRV) position from the (SRV’) position.

Procedure B: 1) Unplug the AC power cord from the wall outlet.
2) Set the mode switch to the (SRV) position.
3) While holding down the JOURNAL FEED key, plug in the AC power cord to the wall outlet.

Note: Procedure B cannot reset the hardware.
Procedure A must be used to reset the hardware.

2. MASTER RESET 2

Please use “Procedure A” or “Procedure B”

Procedure A: 1) Set the mode switch to the (SRV’) position.
2) Plug in the AC power cord to the wall outlet.
3) While holding down the JOURNAL FEED & the RECEIPT FEED keys, turn the mode switch to the (SRV) position from the (SRV’) position.
4) Program the [0] [1] [2] [3] [4] [5] [6] [7] [8] [9] [00] [000] [.] [CL] [@/FOR] [SBTL] [CA/AT] keys by depressing the keys in this order.

Note: If the [000] key is not required, press the same key in the next step, and [000] key will be inhibited.

Procedure B: 1) Unplug the AC power cord from the wall outlet.
2) Set the mode switch to the (SRV) position.
3) While holding down the JOURNAL FEED & the RECEIPT FEED key, plug in the AC power cord to the wall outlet.
4) Repeat the same sequence as in “Procedure A”

Note: Procedure B cannot reset the hardware.
Procedure A must be used to reset the hardware.

3. PROGRAM RESET

Please use either “Procedure A”, “Procedure B” or “Procedure C”

Procedure A: 1) Set the mode switch to the (SRV’) position.
2) Plug in the AC power cord to the wall outlet.
3) Without pressing the JOURNAL FEED key, turn the mode switch to (SRV) position from the (SRV’) position.

Procedure B: 1) Unplug the AC power cord from the wall outlet.
2) Set the mode switch to the (SRV) position.
3) Without pressing the JOURNAL FEED key, plug in the AC power cord from the wall outlet.

Procedure C: 1) Unplug the AC power cord from the wall outlet.
2) Set the mode switch to the PGM2 position.
3) While holding down the JOURNAL FEED key & the RECEIPT FEED key, plug in the AC power cord to the wall outlet.

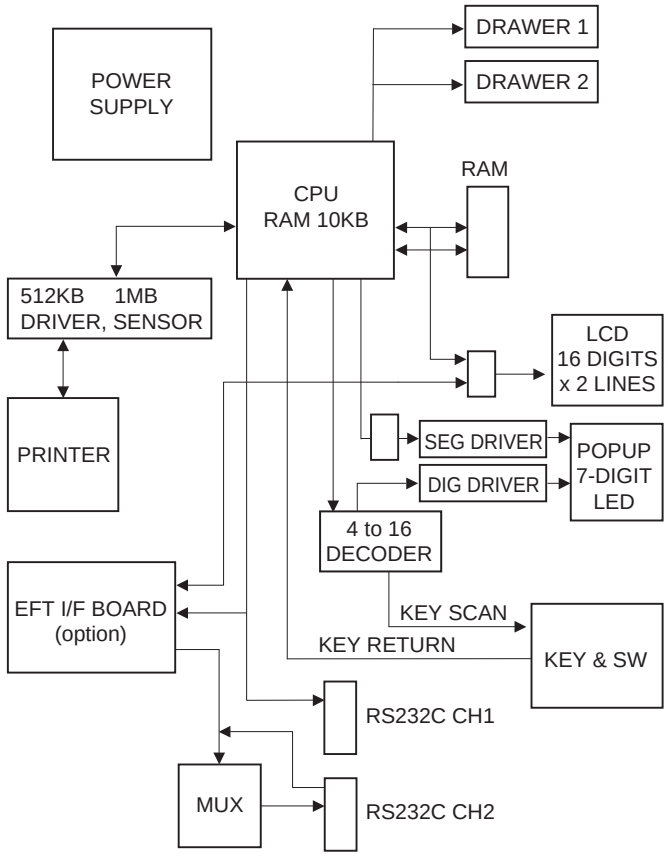
∗“Procedure C” can be executed when SRV#916-B is +4: PROGRAM RESET in PGM2 = ENABLE.

Note: Procedure B and C cannot reset the hardware.
Procedure A must be used to reset the hardware.

CHAPTER 4. HARDWARE DESCRIPTION

1. BLOCK DIAGRAM

ER-A410 and ER-A420



CPU

MITSUBISHI M30620SAFP 12MHz
(INTERNAL RAM 10KB)

EXTERNAL MEMORY

RAM 512KB

FLASH ROM 512KB

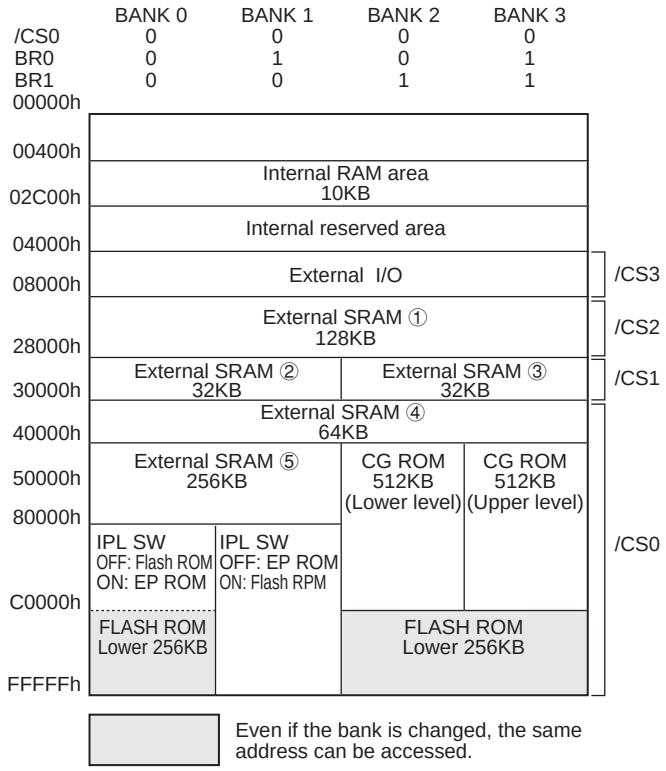
SHARP LH28F004BVT

PRINTER

PR45MII

2. MEMORY MAP

2-1. ADDRESS MAP



Only the /CS0, /CS1 area (28000h~FFFFFh) in the bank is valid.

2-2. EXTERNAL BUS

EXTERNAL BUS ACCSESS SPEED

SRAM/EPROM/FLASH ROM; 2 BCLK

EXTERNAL I/O; 2 BCLK

∗1BCLK = 83.3ns (at 12MHz)

SRAM /CS2 area

address 08000h~27FFFh 128KB

/CS1 area BANK 0,2

address 28000h~2FFFFh 32KB x 2

/CS0 area BANK 0

address 30000h~7FFFFh 320KB

FLASH ROM /CS0 area BANK 0

address 80000h~FFFFFh 258KB

(Moves to Bank 1 when rewriting using EPROM.)

3. CPU PIN TABLE

M16C/24 PORT MEMORY SPACE: NORMAL MODE

PROCESSOR MODE: MICRO PROCESSOR MODE

It is used by a separate BUS (8bit width).

PORT	PIN No.	I/O	Pin name	Signal name	Initial value	OFF MODE	Function
P00	88	I/O	D0	D0		Out L	
P01	87	I/O	D1	D1		Out L	
P02	86	I/O	D2	D2		Out L	
P03	85	I/O	D3	D3		Out L	
P04	84	I/O	D4	D4		Out L	
P05	83	I/O	D5	D5		Out L	
P06	82	I/O	D6	D6		Out L	
P07	81	I/O	D7	D7		Out L	
P10	80	O	P10	RAS	L	Out L	RECEIPT PAPER FEED A
P11	79	O	P11	RBS	L	Out L	RECEIPT PAPER FEED B
P12	78	O	P12	RCS	L	Out L	RECEIPT PAPER FEED C
P13	77	O	P13	RDS	L	Out L	RECEIPT PAPER FEED D
P14	76	O	P14	JAS	L	Out L	JOURNAL PAPER FEED A
P15	75	O	P15	JBS	L	Out L	JOURNAL PAPER FEED B
P16	74	O	P16	JCS	L	Out L	JOURNAL PAPER FEED C
P17	73	O	P17	JDS	L	Out L	JOURNAL PAPER FEED D
P20	72	O	A0	A0		Out L	
P21	71	O	A1	A1		Out L	
P22	70	O	A2	A2		Out L	
P23	69	O	A3	A3		Out L	
P24	68	O	A4	A4		Out L	
P25	67	O	A5	A5		Out L	
P26	66	O	A6	A6		Out L	
P27	65	O	A7	A7		Out L	
P30	63	O	A8	A8		Out L	
P31	61	O	A9	A9		Out L	
P32	60	O	A10	A10		Out L	
P33	59	O	A11	A11		Out L	
P34	58	O	A12	A12		Out L	
P35	57	O	A13	A13		Out L	
P36	56	O	A14	A14		Out L	
P37	55	O	A15	A15		Out L	
P40	54	O	A16	A16		Out L	
P41	53	O	A17	A17		Out L	
P42	52	O	A18	A18		Out L	
P43	51	O	A19	A19		Out L	
P44	50	O	/CS0	/CS0		Out L	
P45	49	O	/CS1	/CS1		Out H	
P46	48	O	/CS2	/CS2		Out H	
P47	47	O	/CS3	/CS3		Out L	

PORT	PIN No.	I/O	Pin name	Signal name	Initial value	OFF MODE	Function
P50	46	O	/WR	/WR		Out L	
P51	45	O	/BHE	(NU)		Out L	
P52	44	O	/RD	/RD		Out L	
P53	43	O	BCLK	BCLK		Out L	
P54	42	O	/HLDA	(NU)		Out L	
P55	41	I	/HOLD	/HOLD		In	
P56	40	O	ALE	(NU)		Out L	
P57	39	I	/RDY	/RDY		In	
P60	38	O	/RTS0	/RS2	H	In	RS-232 /RS2
P61	37	O	CLK0	DRAWER1	L	Out L	DRAWER 1 DRIVE SIGNAL
P62	36	I	RXD0	RD2		In	RS-232 RD2
P63	35	O	TXD0	SD2	H	In	RS-232 SD2
P64	34	O	/RTS1	/RS1	H	In	RS-232 /RS1
P65	33	O	P65	/EFTRES	H	Out L	EFT RESET SIGNAL
P66	32	I	RXD1	RD1		In	RS-232 RD1
P67	31	O	TXD1	SD1	H	In	RS-232 SD1
P70	30	O	TXD2	SO	L	Out L	PRINTER DATA OUT
P71	29	I	RXD2	SI		In	PRINTER DATA IN
P72	28	O	CLK2	PCLK	L	Out L	PRINTER CLOCK
P73	27	O	P73	DRAWER2	L	Out L	DRAWER 2 DRIVE SIGNAL
P74	26	O	P74	/ER1	H	In	RS-232 /ER1
P75	25	I	P75	/CD1		In	RS-232 /CD1
P76	24	I	P76	/CS1		In	RS-232 /CS1
P77	23	I	P77	/DR1		In	RS-232 /DR1
P80	22	O	P80	BUZZER	L	Out L	
P81	21	O	P81	VHCOM	L	In	PRINTER HEAD CONTROL
P82	20	I	/NIT0	POFF		In	
P83	19	I	P83	/EFTC		In	EFT PWB connect
P84	18	O	P84	/ER2	H	In	RS-232 /ER2
P85	17	I	/NMI	/NMI (NU)		In	
P86	11	O	XCOUT	XCOUT			32.768kHz
P87	10	I	XCIN	XCIN			32.768kHz
P90	7	I	P90	MODE		In	MODE KEY SENSE
P91	6	I	P91	MSENS		In	MISCELLA-NEOUS SENSE
P92	5	O	P92	BA1	L	Out L	BANK 1 SIGNAL
P93	4	O	P93	BA0	L	Out L	BANK 0 SIGNAL
P94	3	O	P94	DATA/CE	L	Out L	LCD DATA LATCH SIGNAL
P95	2	O	P95	BLON	L	Out L	BACK LIGHT ON

PORT	PIN No.	I/O	Pin name	Signal name	Initial value	OFF MODE	Function
P96	1	O	P96	LCDON	L	Out L	LCD POWER ON
P97	100	I	P97	IPLON		In	IPL ON SIGNAL
P100	97	I	AN0	TM		In	HEAD TEMPERATURE MONITOR
P101	95	I	AN1	VPTEST		In	HEAD VOLTAGE MONITOR
P102	94	I	AN2	VREF		In	REFERENCE VOLTAGE
P103	93	O	AN3	/STRB1	H	In	PRINTER STORE SIGNAL 1
P104	92	O	AN4	/STRB2	H	In	PRINTER STORE SIGNAL 2
P105	91	O	P105	/STRB3	H	In	PRINTER STORE SIGNAL 3
P106	90	O	P106	/STRB4	H	In	PRINTER STORE SIGNAL 4
P107	89	O	P107	LATCH	L	In	PRINTER LATCH SIGNAL

POWER SUPPLY/CONTROL PINS

PORT	PIN No.	I/O	PIN NAME	FUNCTION
BYTE	8	I	BYTE	Connected to VDD
CNVSS	9	I	CNVSS	Connected to GND
/RESET	12	I	/RESET	
XOUT	13	O	XOUT	OPEN
VSS	14		VSS	Connected to GND
XIN	15	I	XIN	Connected to Spectram
VCC	16		VCC	Connected to VDD
VCC	62		VCC	Connected to VDD
VSS	64		VSS	Connected to GND
AVSS	96		AVSS	Connected to GND
VREF	98		VREF	Connected to VDD
AVCC	99		AVCC	Connected to VDD

4. PRINTER CONTROL

The PR-45M II printer is used.

4-1. STEPPING MOTOR CONTROL

The stepping motor is driven at a constant voltage by the Sanken STA471A.

1step: 0.125mm, 1dot: 1step

Printing speed: 50mm/s

<CPU's PORT>

No.	CPU PORT	Signal to be used
80	P10	RAS
79	P11	RBS
78	P12	RCS
77	P13	RDS
76	P14	JAS
75	P15	JBS
74	P16	JCS
73	P17	JDS

<DRIVING STEP>

RECEIPT MOTOR

	Driver IC input (CPU output)				Motor drive signal			
STEP	RAS	RBS	RCS	RDS	/RPFA	/RPFB	/RPFC	/RPFD
1	H	L	L	H	L	H	H	L
2	L	H	L	H	H	L	H	L
3	L	H	H	L	H	L	L	H
4	H	L	H	L	L	H	L	H

	Driver IC input (CPU output)				Motor drive signal			
STEP	JAS	JBS	JCS	JDS	/JPFA	/JPFB	/JPFC	/JPFD
1	L	H	H	L	H	L	L	H
2	L	H	L	H	H	L	H	L
3	H	L	L	H	L	H	H	L
4	H	L	H	L	L	H	L	H

∗When the motor is at rest, the same phase as the final excitation phase is RUSH-energized for 10 ms to turn off all phases.
→ Turn all AS~RDS and JAS~JDS into L.
No energizing should be allowed at least 30 ms after stopping the motor before restarting.
When starting the motor, the first excitation phase is RUSH energized for 10 ms to start the motor by acceleration control.

4-2. HEAD CONTROL

HEAD: 864 dots in all Printable range

RECEIPT side 384 dots
JOURNAL side 384 dots

Related PORT

No.	CPU PORT	Signal to be used
30	TXD2	SO
29	RXD2	SI
28	CLK2	PCLK
93	P103	/STRB1
92	P104	/STRB2
91	P105	/STRB3
90	P106	/STRB4
89	P107	LATCH
21	P81	VHCOM

/STB1: 1~288dot: 288 dots in all
/STB2: 289~432dot: 144 dots in all
/STB3: 433~576dot: 144 dots in all
/STB4: 577~864dot: 288 dots in all
] Total 864 dots

∗When turning off the printer power supply, make sure to turn /STB1,2,3,4 to “H.”

∗Do not turn on without paper.

∗THERMAL HEAD power supply control: Turn ON when P81 = ”H”; turn OFF when at “L.” (The power supply for HEAD and STEPPING MOTOR is shared.) When printing is finished, (when the motor is stopped), the power should be turned off.

∗Before printing or feeding paper, the A/D conversion is performed in 10ms after the printer head is turned on to make sure the voltage is stable.

5. A/D CONVERSION

The following three kinds of signals are inputted to the A/D conversion port of the ER-A410/ER-A420.

<CPU’s PORT>

No.	CPU PORT	Signal to be used	Function
97	AN0	TM	PRINTER HEAD TEMPERATURE MONITOR
95	AN1	VPTEST	PRINTER HEAD VOLTAGE MONITOR
94	AN2	VREF	REFERENCE VOLTAGE

5-1. PRINTER HEAD TEMPERATURE MONITOR

The voltage divided by the resistor and the thermistor for detecting the temperature of the printer head is inputted to the AN0 pin. As shown below, the printer head energizing is controlled.

HEAD TEMPERATURE	A/D CONVERSION VALUE (DEC)	OPERATION
-10°C or below	929~1023	MOTOR LOCK
-10°C ~ 0°C	869~928	PRINT IN ENERGIZING TIME AT 0°C
0°C ~ 70°C	232~868	PRINT IN ENERGIZING TIME SHOWN IN PR-45 CONTROL SPEC
70°C or above	0~231	MOTOR LOCK

5-2. PRINTER HEAD VOLTAGE MONITOR

A voltage is supplied by the printer head power supply, passed through the printer, divided by the resistor, and inputted to AN1 pin. Before reading the A/D conversion value, turn the VHCOM signal (CPU P81) to “H” and make sure the voltage is stable. Then read the A/D conversion value.

The printable voltage range for the printer is 15V~26V. The voltage is calculated from the AN1 value and the A/D conversion value of the reference voltage of AN2.

5-3. REFERENCE VOLTAGE

The reference voltage (2.495V±0.085V) generated by KIA431F is inputted to AN2 pin.

469 (DEC) ≦ VREF ≦ 557 (DEC)

VREF 469 (DEC) corresponds to VREF = 2.41V at VCC = 5.25V

VREF 557 (DEC) corresponds to VREF = 2.58V at VCC = 4.75V

6. KEY/DISPLAY

6-1. LCD CONTROL

The LCD control is the same for the ER-A410/ER-A420.

LCD-related Register

Function	Address	R/W
LCD Write Data	04001h	W
LCD Read Data	04002h	R
LCD Control Signal / Key Strobe Signal	04003h	W
Data Latch Signal	CPU port P94	W

<LCD Control Signal/Key Strobe Signal>

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04003h	–	E	R/W	RS	KS3	KS2	KS1	KS0

Bit7: Not used

Bit6: E
Enable Signal ⎍ Enable

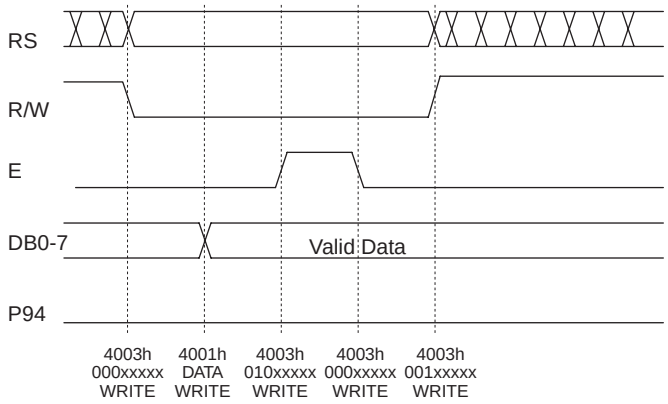
Bit5: R/W
H: Data read L: Data Write

Bit4: RS
H: Data input L: Instruction Input

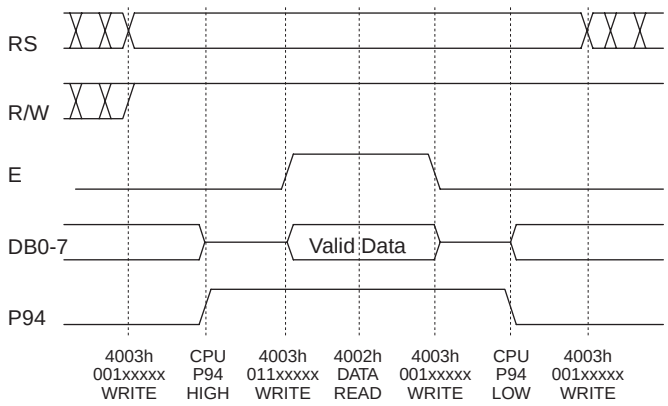
<Data Latch Signal> P94

L: LCD write data latch

DATA WRITE (CPU → LCD)



DATA READ (CPU ← LCD)



6-2. KEY/DISPLAY SCAN

On the ER-A410/ER-A420, the key and display scan signal is common.

Key/display scan and key read are performed at the following timing.

① Key/display scan cycle: 10ms

② Blanking time: 50us

③ KEY DATA READ timing: 10 ~100us before turning off the strobe signal
KEY DATA are read in two divisions by switching the exchange signal.

Key/Display-related Register

Function	Address	R/W
LED Segment Signal	04000h	W
LCD Control Signal / Key Strobe Signal	04003h	W
Key Return Signal	04003h	R
Key Exchange Signal	04003h Bit7	W
Key Select Signal	CPU port P90	R

<LED Segment Signal> Write

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04000h	dp	g	f	e	d	c	B	a

<LCD Control Signal/Key Strobe Signal> Write

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04003h	X	E	R/W	RS	KS3	KS2	KS1	KS0

Bit3~0: KS3~0

At KS3~0, the strobe signals of KEY and POP UP Display are generated.

<Key Return Signal, Key Exchange Signal> Read Flat Keyboard

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04001h	X	X	X	X	KR11	KR10	KR9	KR8
04003h	KR7	KR6	KR5	KR4	KR3	KR2	KR1	KR0

<Key Return Signal> Read Normal Keyboard

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04003h	KR7	KR6	KR5	KR4	KR3	KR2	KR1	KR0

<Key Select Signal>

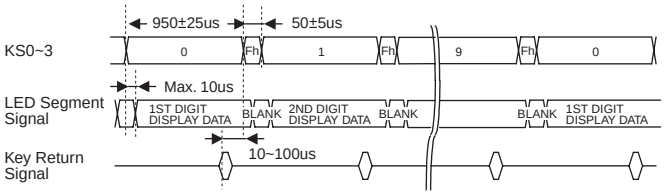
READ is performed at the timing of ST9 of CPU port P90 (Refer to 6-3.)

1: NORMAL KEY

0: FLAT KEY

The flat keyboard switches the key exchange signal and takes key data in two times. For the reading timing, refer to the timing chart below.

The normal keyboard reads key data 10~100us before turning off the strobe signal of the keyboard.



6-3. OTHERS

	CPU	STO	ST1	ST2	ST3	ST4	ST5	ST6	ST7	ST8	ST9
MODE	P90	SRV	PGM	VOID	OP X/Z	REG	MGR	X1/Z1	X2/Z2		Key Select
OTHERS	P91	PF-R	PF-J	RPE	HEAD UP	JPE		DRAWER OPEN			RS1_CI

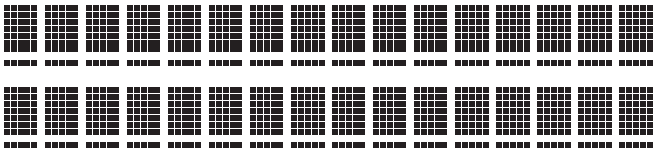
The MODE key switch and other sensor signals are read with the CPU port P90 and 91 at the keyboard strobe timing. Reading is performed 10~100us before turning off the strobe signal.

P90	ST0 :	MODE Key SRV	“0” SRV mode
	ST1 :	MODE Key PGM	“0” PGM mode
	ST2 :	MODE Key VOID	“0” VOID mode
	ST3 :	MODE Key OP X/Z	“0” OP X/Z mode
	ST4 :	MODE Key REG	“0” REG mode
	ST5 :	MODE Key MGR	“0” MGR mode
	ST6 :	MODE Key X1/Z1	“0” X1/Z1 mode
	ST7 :	MODE Key X2/Z2	“0” X2/Z2 mode
	ST9 :	Keyboard select	“0” Flat key
			“1” Normal key
P91	ST0 :	Receipt feed	“0” Receipt feed
	ST1 :	Journal feed	“0” Journal feed
	ST2 :	Receipt paper end	“1” Receipt paper end
	ST3 :	Head up	“0” Head up
	ST4 :	Journal paper end	“1” Journal paper end
	ST6 :	Drawer open sensor	“0” Drawer open
	ST9 :	RS-232 ch1 CI signal	

6-4. DISPLAY

The ER-A410/A420 is provided with the front LCD of 5 x 7dot, 2 lines 16 digits, and the 7-digit LED on the pop up side.

FRONT:



POP UP:

• DISPLAY DIGIT SIGNAL

The above ST0~ST6 are DIGIT signals.

ST0: 1st digit~ST6:7th digit

• DISPLAY SEGMENT SIGNAL (REFER TO 6-2.)

By writing segment data to 4000h, the LED segment signal can be outputted.

DATA~SEGMENT correspondence

D0~D6 → a~g

D7 → DP

7. SERIAL I/O

The ER-A410/ER-A420 is provided with 2 channels of RS-232 PORTs as standard provision.

The RS-232 ch1 and ch2 are assigned to the following CPU port and I/O.

Ch1

Pin No.	CPU PORT	Signal to be used
34	/RTS1	/RS1
32	RXD1	RD1
31	TXD1	SD1
26	P74	/ER1
25	P75	/CD1
24	P76	/CS1
23	P77	/DR1
6	P91 (Refer to 6-3.)	/CI1

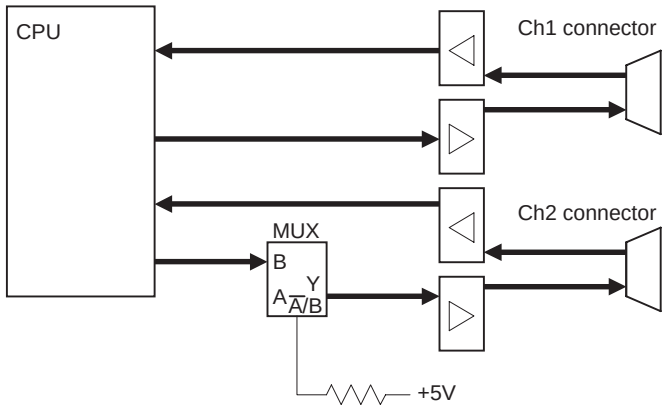
Ch2

Pin No.	CPU PORT	Signal to be used
38	/RTS0	/RS2
36	RXD0	RD2
35	TXD0	SD2
18	P84	/ER2

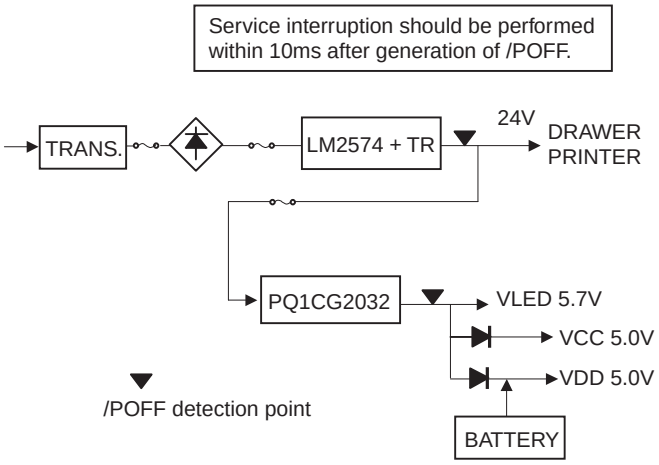
<Serial I/O ch2 receive signal> Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bir1	Bit0
04000h	X	X	X	X	/CD2	/DR2	/CS2	/CI2

RS-232 I/F BLOCK DIAGRAM



8. POWER



9. FLASH MEMORY REWRITE PROCEDURE

IPL from EP-ROM: Set the IPL SW to ON and turn on the power, and the EP-ROM will be boosted.

The bank of the EP-ROM program is switched through S-RAM to transfer the program to the FLASH ROM.

10. DRAWER

The ER-A410/ER-A420 is provided with 2 separate DRAWER ports.

The DRAWER solenoid energizing time is as shown below.

50ms (max) 45ms(min)

11. PRINT RATIO LIMITATION

Max. 288dot/1line x 140line (Corresponds to black background LOGO print.)

Ave. 108dot/1line or less (Corresponds to 12.5% of all dots.)

12. BUZZER

A piezo type buzzer is used.

The oscillation frequency is 2.048kHz ± 0.5kHz.

13. RESET

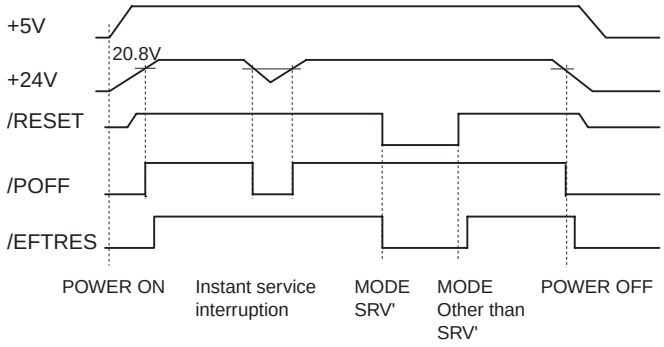
The RESET signal is generated under the following condition.

1) When the MODE KEY SWITCH is moved from SRV' to another position (except for OFF).

14. POFF

The POFF signal is changed from 0 to 1 when the 5V system power and the 24V system power reach the operating voltage. When they fall below the operating voltage, the signal is changed from 1 to 0.

POFF, RESET TIMING CHART



15. I/O

<LED Segment Signal> Write

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04000h	dp	g	f	e	d	c	B	a

<Serial I/O ch2 receive signal> Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04000h	X	X	X	X	/CD2	/DR2	/CS2	/CI2

<LCD Write Data> Write

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04001h	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

<Key Return Signal, Key Exchange Signal> Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04001h	X	X	X	X	KR11	KR10	KR9	KR8

<LCD Read Data> Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04002h	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

<LCD Control Signal/Key Strobe Signal> Write

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04003h	X	E	R/W	RS	KS3	KS2	KS1	KS0

<Key Return Signal> Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04003h	KR7	KR6	KR5	KR4	KR3	KR2	KR1	KR0

<LCD Control Signal/Key Strobe Signal> Write

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
04003h	X	E	R/W	RS	KS3	KS2	KS1	KS0

<EFT Data> Write/Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0400Eh	D7	D6	D5	D4	D3	D2	D1	D0

<EFT Status> Read

Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0400Fh	X	X	X	X	X	CLM	IBF	OBF

CHAPTER 5. DIAGNOSTIC PROGRAM

1. TEST ITEMS

The test items are as follows:

	Code	Description
1)	100	Display buzzer test
2)	101	Key code
3)	102	Printer test
4)	104	Keyboard test
5)	105	Mode switch test
6)	106	Printer sensor test
7)	107	Clock test
8)	110	Drawer 1 open & sensor test
9)	111	Drawer 2 open & sensor test
10)	116	LCD CG test
11)	120	External RAM test
12)	121	CPU internal RAM test
13)	130	FLASH ROM test
14)	160	AD conversion port test
15)	500	RS232 ch1 test
16)	501	RS232 ch2 test

∗Starting DIAG.

Mode switch: SRV
key operation: Above code + “CA/AT” key

2. DESCRIPTION OF EACH DIAG PROGRAM

1) DISPLAY BUZZER TEST

① Key operation

100 → CA/AT

② Test procedure

OP display

D	I	S	P		B	U	Z	Z	E	R		S	R	V	
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

Rear display 4.5.6.7.8.9.0.

The decimal point on the LED and the cursor on the LCD will shift from the lower digit to the upper digit in steps of 1 digit (every 200 msec)
After that, all segments will turn on (about 1 sec)
These two modes are repeated.
At the same time, the buzzer sounds continuously.

③ Check that:

A) Each position is correctly displayed.

B) The brightness of each number is uniform.

C) The buzzer sound is normal.

④ End of testing

You can exit the test mode by pressing any key. The following is printed.

1 0 0

2) KEY CODE

① Key operation

101 → CA/AT

② Test procedure

OP display

K	E	Y		C	O	D	E					S	R	V	
○													○	○	○

KEYBOARD KEY CODE

③ Check that:

KEYBOARD: 1: Normal type 0: Flat type

KEY code: Every time a key is pressed, the hard code of that key is displayed as a decimal number.
When a key is pressed twice or pressed in an incorrect manner, --- will be displayed.

④ End of testing

You can exit the test mode by turning the mode switch to a position other than the PGM mode. The printer prints as follows:

1 0 1

3) PRINTER TEST

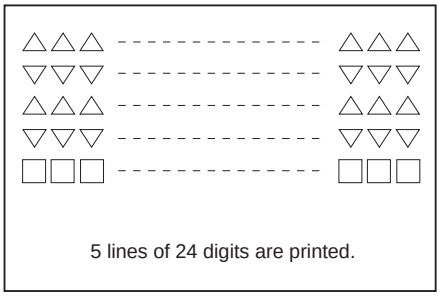
① Key operation

102 → CA/AT

② Test procedure

OP display

R	/	J		P	R	I	N	T	E	R		S	R	V	



At the receipt side, the logo is also printed and the receipt is issued.

③ Check that:

The print is free from contamination, blur, and uneven density.

④ End of testing

The test will end automatically.

4) KEYBOARD TEST

① Key operation

_ _ _ _104 → CA/AT

↑

KEY check sum code

② Test procedure

The keyboard is checked using the sum check code of the key code.

If the sum check code is not entered, the check is made using the sum check code of the default keyboard arrangement

The sum check data for each model is entered to the front 4 digits of the DIAG code, and that data is compared with the key data added until the final key (CA/AT) is pressed.

Both data are the same, the test ends, printing the number given below.

If both data are different, the printer prints the error message.

OP display

K	E	Y		B	O	A	R	D				S	R	V	
1	0	4											○	○	○

KEY CODE

③ Check:

A) The content of completion print

④ End of testing

When the test ends normally: **1 0 4**

When an error occurs: E – ~ – **1 0 4**

Note: Calculation of key sum check data
Hard codes (hexadecimal number) at the position (excluding feed key) where there is an input data contact are added.
However, the end key (TL) is not added.
This data to which hard codes have been added is converted into a decimal number value, which will become the sum check data that will be entered when DIAG is started.

5) MODE SWITCH TEST

① Key operation

105 → CA/AT

② Test procedure

OP display

M	O	D	E		S	W					S	R	V	
1	0	5												X

MODE: SRV_PGM2_PGM1_OFF_OP X/Z_REG_MGR_X1/Z1_X2/Z2__SRV

X : 0 1 2 9 3 4 5 6 7 0

The above X must be read in the correct order. (If the contact is open, 9 will be displayed.)

③ Check:

The display during testing and the content of the completion print.

④ End of testing

When the test ends normally **1 0 5**

When an error occurs: E – ~ – **1 0 5**

6) PRINTER SENSOR TEST

① Key operation

106 → CA/AT

② Test procedure

Check the status of the paper end sensor and head up sensor.

OP display

R	/	J		S	E	N	S	O	R			S	R	V	
1	0	6											X	–	Y

③ Check the following.

X: 1 - Paper present at the receipt side
O - No paper at the receipt side

Y: 1 - Paper present at the journal side
O - No paper at the journal side

④ End of testing

You can exit the test mode by pressing any key and the printer prints the following.

1 0 6

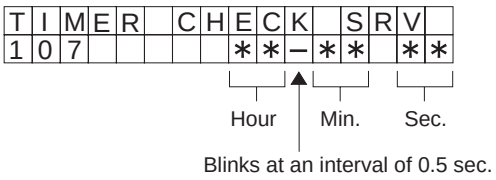
7) CLOCK TEST

① Key operation

107 → CA/AT

② Test procedure

OP display

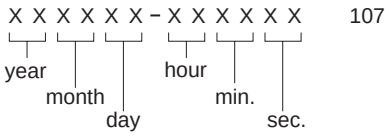


③ Check that:

"–" blinks and the clock counts up.

④ End of testing

When any key is pressed, the date and time are printed and the test mode will be terminated.



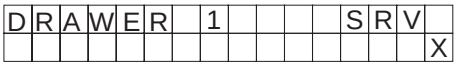
8) DRAWER 1 OPEN & SENSOR TEST

① Key operation

110 → CA/AT

② Test procedure

OP display



X : O = DRAWER OPENED
C = DRAWER CLOSED

③ Check that:

A) The drawer 1 opens normally.

B) The sensor correctly indicates the status of the drawer 1.

④ End of testing

You can exit the test mode by pressing any key. The printer prints the following.

1 1 0

9) DRAWER 2 OPEN & SENSOR TEST

① Key operation

111 → CA/AT

② Test procedure

OP display

X : O = DRAWER OPENED
C = DRAWER CLOSED

③ Check that:

A) The drawer 2 opens normally.

B) The sensor correctly indicates the status of the drawer 2.

④ End of testing

You can exit the test mode by pressing any key. The printer prints the following.

1 1 1

10) LCD CG TEST

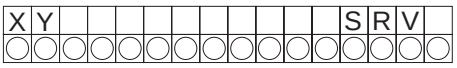
① Key operation

116 → CA/AT

② Test procedure

To check the display CG, 256 pieces of built-in CG's are grouped into 16 blocks and each 16 characters is displayed on the dot display.
At first, CG code of 00H ~ 0FH is displayed. By pressing any key, each block is displayed in sequence.

OP display



"O" indicates the CG display position.

"XY" indicates the code at the head of each block in hexadecimal number.
(Example: 10, A0)

③ Check that:

A) Displays are clear.

B) Free from blur, chip-off, unevenness.

④ End of testing

You can exit the test mode by pressing any key. The printer prints the following.

1 1 6

11) EXTERNAL RAM TEST

① Key operation

120 → CA/AT

② Test procedure

The standard 256 Kbyte RAM is checked.

The contents of memory must be stored before and after this test.

RAM (08000H~7FFFFH area and 28000H~2FFFFH area) is tested in the following procedure:

a) Store data in the test areas

b) Write "00H"

c) Read and compare "00H" and then write"55H"

d) Read and compare "55H" and then write "AAH"

e) Read and compare "AAH"

f) Restore stored data

If an error occurs at a step, the error is printed.
If any error does not occur, the following addresses are checked in turns.

Addresses to be checked:

08000H, 08001H, 08002H, 08004H, 08008H, 08010H, 08020H, 08040H, 08080H, 08100H, 08200H, 08400H, 08800H, 09000H, 0A000H, 0C000H, 10000H, 18000H, 28000H (BANK 0), 28000H (BANK 3), 30000H, 40000H

OP display

R	A	M									S	R	V		
1	2	0													

③ Check:

A) The completion print.

④ End of testing

The program ends after printing as follows:

When the test ends normally: 120

When the test end abnormally: Ex – ~ – 120

∗∗∗∗∗

x = 1: Data error

x = 2: Address error

When an error occurs, the printer outputs the error message and the address where the error has occurred in the area ∗∗∗∗∗.

12) CPU INTERNAL RAM TEST

① Key operation

121 → CA/AT

② Test procedure

The test program tests internal RAM (10 Kbytes) of the CPU.
The contents of memory must be stored before and after this test.
RAM (00400H ~ 02BFFH area) is tested in the following procedure.

a) Store data in the test area.

b) Write "00H"

c) Read and compare "00H" and then write "55H"

d) Read and compare "55H" and then write "AAH"

e) Read and compare "AAH"

f) Restore stored data

If an error occurs at a step, the error is printed.
If any error does not occur, the following addresses are checked in turns.

Addresses to be checked:

01000H, 01001H, 01002H, 01004H, 01008H
01010H, 01020H, 01040H, 01080H,
01100H, 01200H, 01400H, 01800H,
02000H

OP display

C	P	U		R	A	M					S	R	V		
1	2	1													

③ Check:

The completion print.

④ End of testing

The test program ends after printing.

When the test ends normally: 121

When the test ends abnormally: Ex – ~ – 121

∗∗∗∗∗

x = 1: Data error

x = 2: Address error

If an error occurs, the printer outputs the error message and the address where the error has occurred in the area ∗∗∗∗∗.

13) FLASH ROM TEST

① Key operation

130 → CA/AT

② Test procedure

The test program checks that the checksum of the flash ROM (BANK0F80000H ~ FFFFFH).

The lower two digits of the checksum should be 10H. (pending)

OP display

F	L	A	S	H		R	O	M				S	R	V	
1	3	0													

③ Check:

The completion print.

④ End of testing

The test will automatically be terminated and the printer prints as follows:

When the test ends normally: 130

ROM ∗∗∗∗∗∗∗∗ (Model name)
∗∗∗∗∗∗∗∗ (Version)

When the test ends abnormally: E – – ~ – – 130

ROM ∗∗∗∗∗∗∗∗ (Model name)
∗∗∗∗∗∗∗∗ (Version)

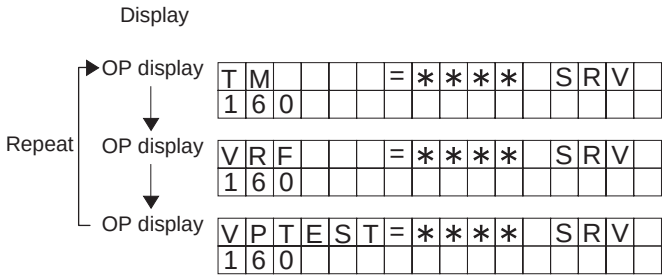
14) AD CONVERSION PORT TEST

① Key operation

160 → CA/AT

② Test procedure

The test program displays the voltage of each AD conversion port.



③ End of testing

You can exit the test mode by pressing any key. The printer prints the following.

1 6 0

15) RS232 CH1 TEST

Install the RS232 loopback connector.

① Key operation

500 → CA/AT

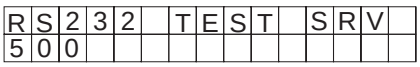
② Test procedure

The test program checks the control signals.

OUTPUT		INPUT			
/ER1	/RS1	/DR1	/CI1	/CD1	/CS1
OFF	OFF	OFF	OFF	OFF	OFF
OFF	ON	OFF	OFF	ON	ON
ON	OFF	ON	ON	OFF	OFF
ON	ON	ON	ON	ON	ON

Data communication check
A loopback test of 256-byte data between is performed.
DATA: $00 - $FF BAUD RATE:9600 BPS

OP display



③ Check:

The completion print.

④ End of testing

Completion print		RS TEST	OK
Error print		RS TEST	**NG**ERxx
xx	Contents of error		
01	ER DR error		
02	ER CI error		
03	RS CD error		
04	RS CD error		
05	SD RD error	DATA error	
06	SD RD error	DATA error/framing error	

16) RS232 CH2 TEST

Install the RS232 loopback connector.

① Key operation

501 → CA/AT

② Test procedure

The test program checks the control signals.

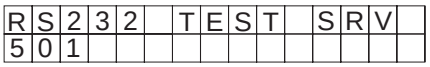
OUTPUT		INPUT			
/ER2	/RS2	/DR2	/CI2	/CD2	/CS2
OFF	OFF	OFF	OFF	OFF	OFF
OFF	ON	OFF	OFF	ON	ON
ON	OFF	ON	ON	OFF	OFF
ON	ON	ON	ON	ON	ON

Data communication check

A loopback test of 256-byte data between is performed.

DATA: $00 - $FF BAUD RATE: 9600 BPS

OP display



③ Check:

The completion print.

④ End of testing

Completion print		RS TEST	OK
Error print		RS TEST	**NG**ERxx
xx	Contents of error		
01	ER DR error		
02	ER CI error		
03	RS CD error		
04	RS CD error		
05	SD RD error	DATA error	
06	SD RD error	DATA error/framing error	

3. KEY CODE TABLE

ER−A410U

↑ RF	↑ JF																
033	037	051	131	115		067		147	148		003	004					
032	048	052	132	116	084	068	146	018		002	005						
038	054	050	130	114	082	066	149	145		017	001						
039	055	053	133	117	085	069	065	064		016	000						
		128	129	113	081	080	086	070		022	006						
		118		112	102	103	087	071		007							

CHECK SUM : 4 2 8 9

ER−A420U

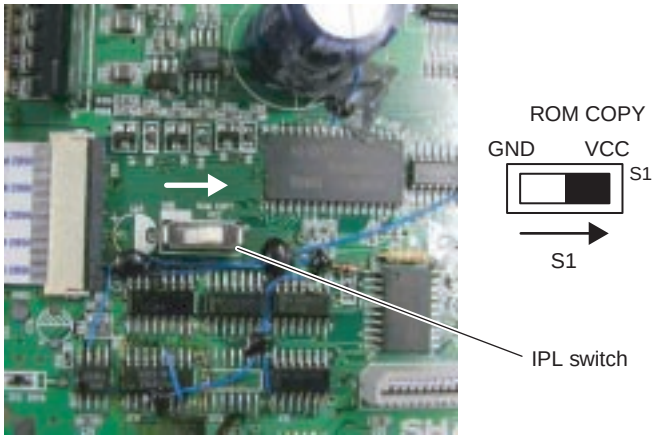
↑ RF	↑ JF																
128	112	096	103	113	097	115	051	084	100	102	101	117	089	105	106	107	
064	119	135	130	129	131	116	132	118	134	085	104	136	073	122	090	123	
080	087	082	066	081	083	068	086	150	070	069	072	088	153	154	074	139	
144	071	146	050	145	147	148	054	038	053	149	152	056	057	058	075	091	
016	151	034	017	001	019	052	036	022	021	037	040	025	041	042	059	027	
000	007	023	018	002	003	020	004	006	005	024	008	009	010	026	043	011	

CHECK SUM : 8 9 4 0

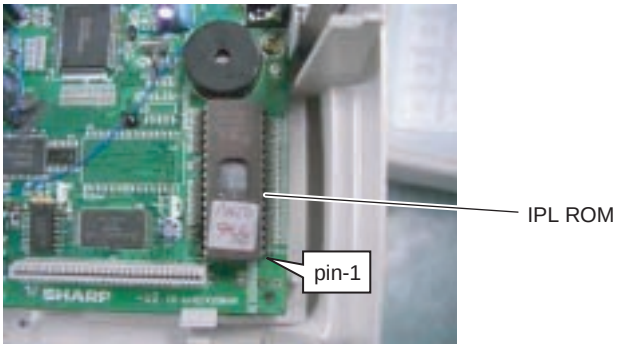
CHAPTER 6. IPL FROM EP-ROM

Before installation, unplug the AC power cord from the AC outlet.

1. Open the top cabinet.
2. Set the IPL switch (S1) to ROM COPY position.



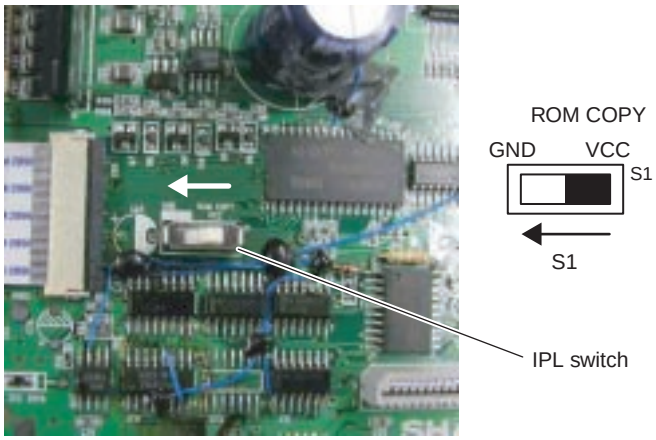
3. Install the IPL ROM in the IC socket of the MAIN PWB.



4. Turn the mode key switch to SRV' position, and insert the AC power cord into the AC outlet.
5. Turn the mode key switch to SRV position. The IPL procedure is started.

   When the procedure is completed, the message of "Completed" is shown.

6. Unplug the AC power cord from the AC outlet.
7. Remove the IPL ROM from to the IC socket of the MAIN PWB.
8. Set the IPL switch (S1) to GND position.



9. Replace the top cabinet.
10. Perform the master reset.

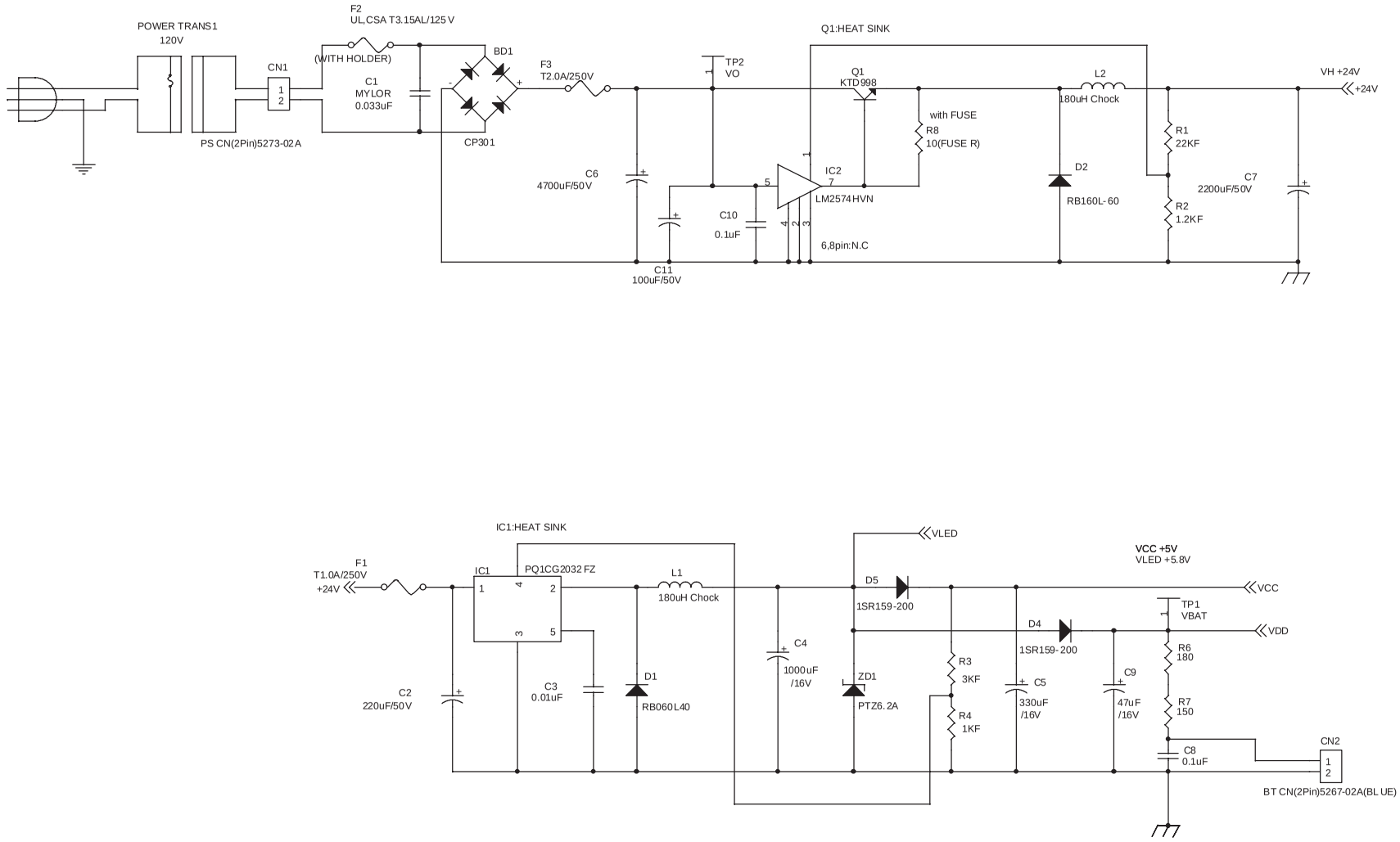
    Turn the mode key switch to the SRV' position, insert the AC power cord into the AC outlet.
    While holding down the Journal feed key, turn the mode key from the SRV position to the SRV' position.

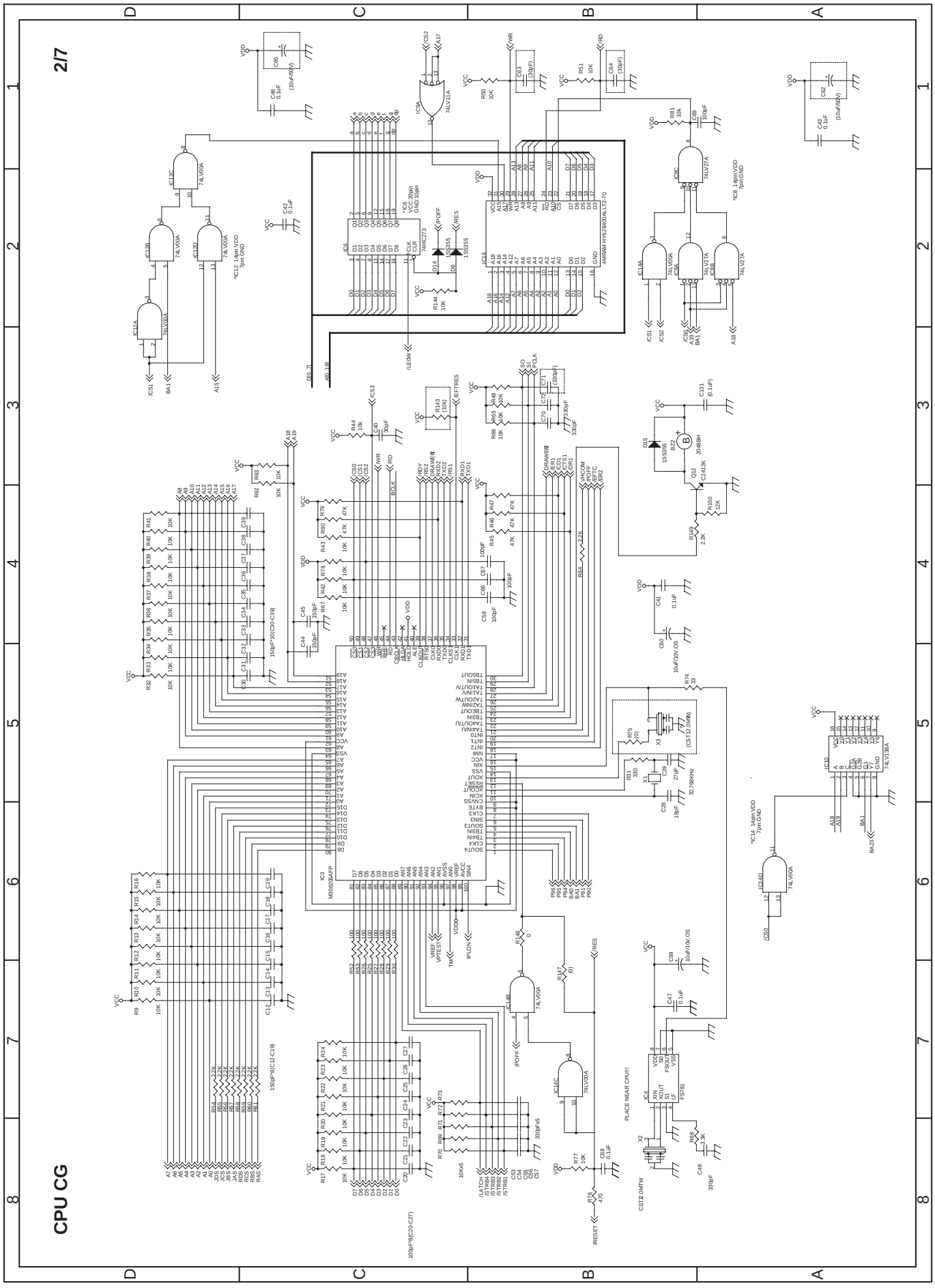
CHAPTER 7. CIRCUIT DIAGRAM AND PWB LAYOUT

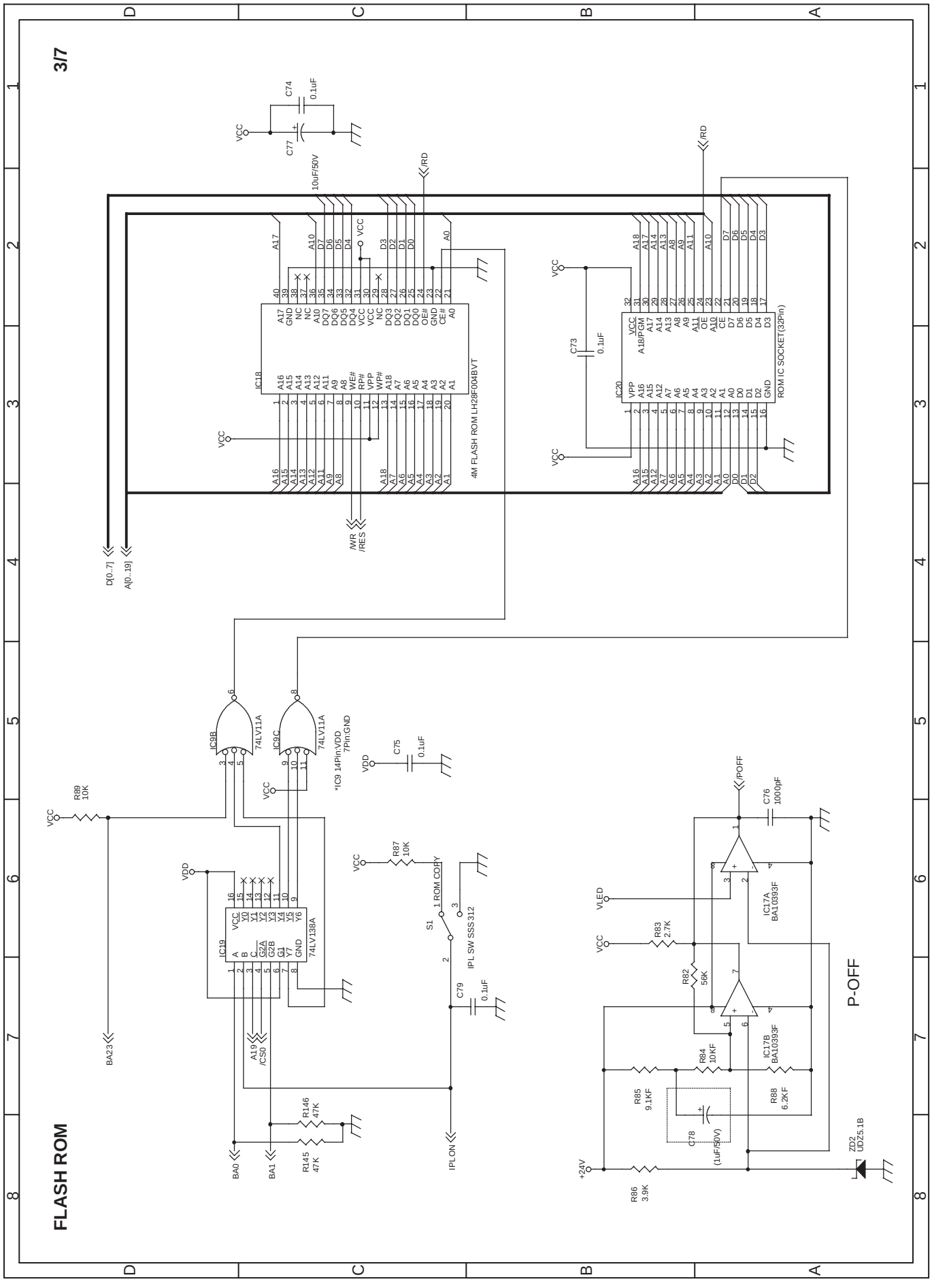
1/7

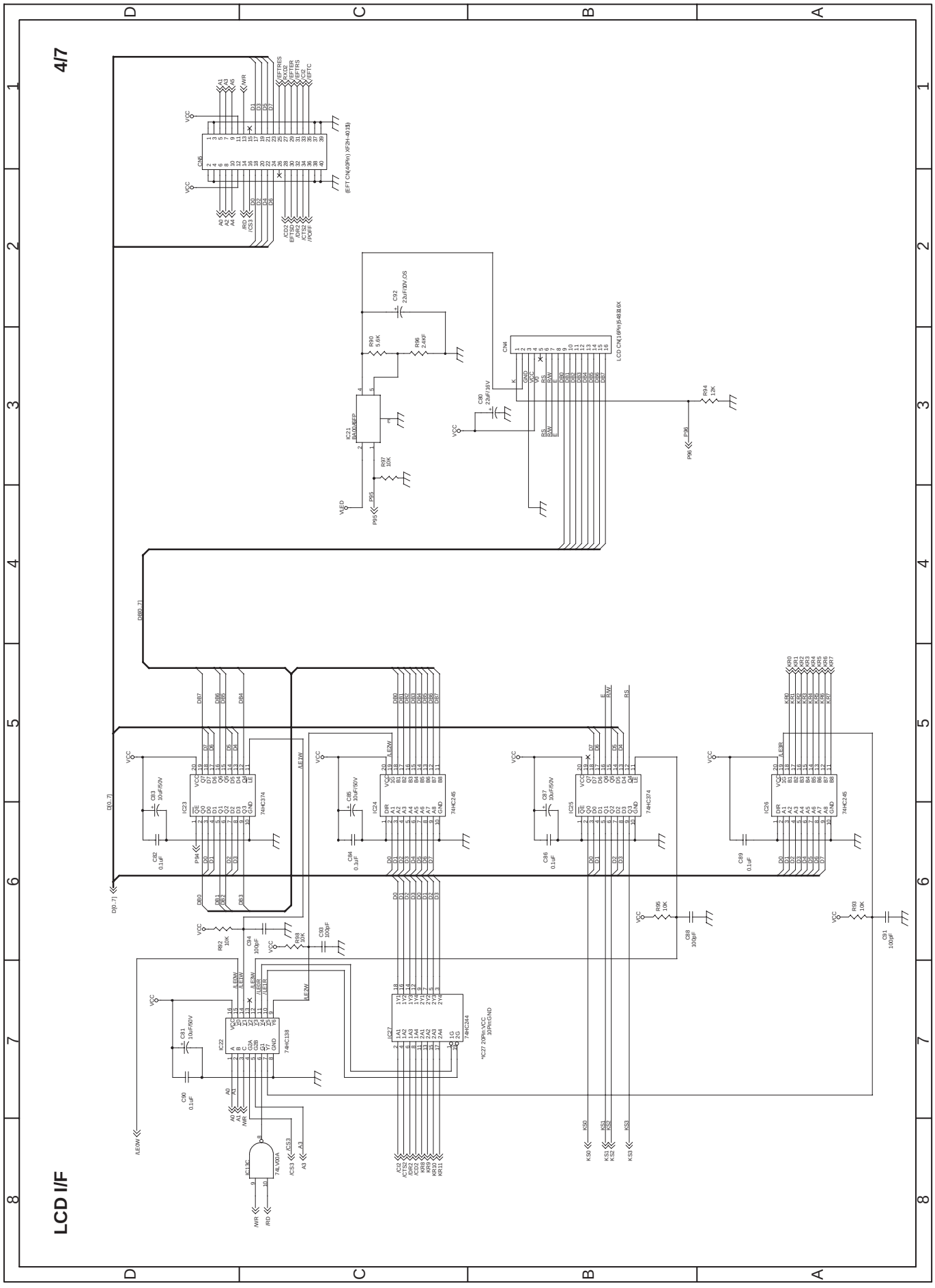
MAIN PWB

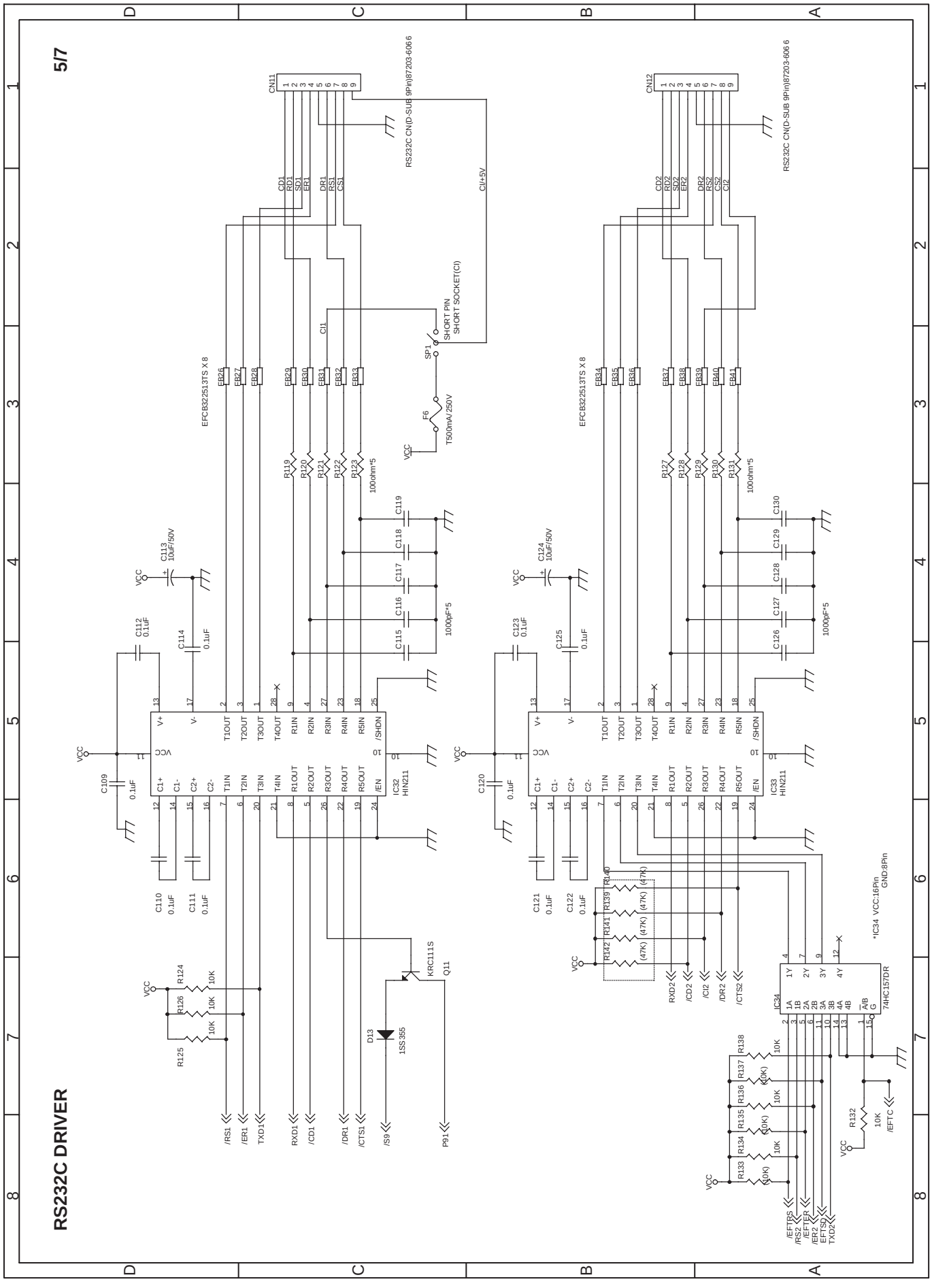
POWER SUPPLY

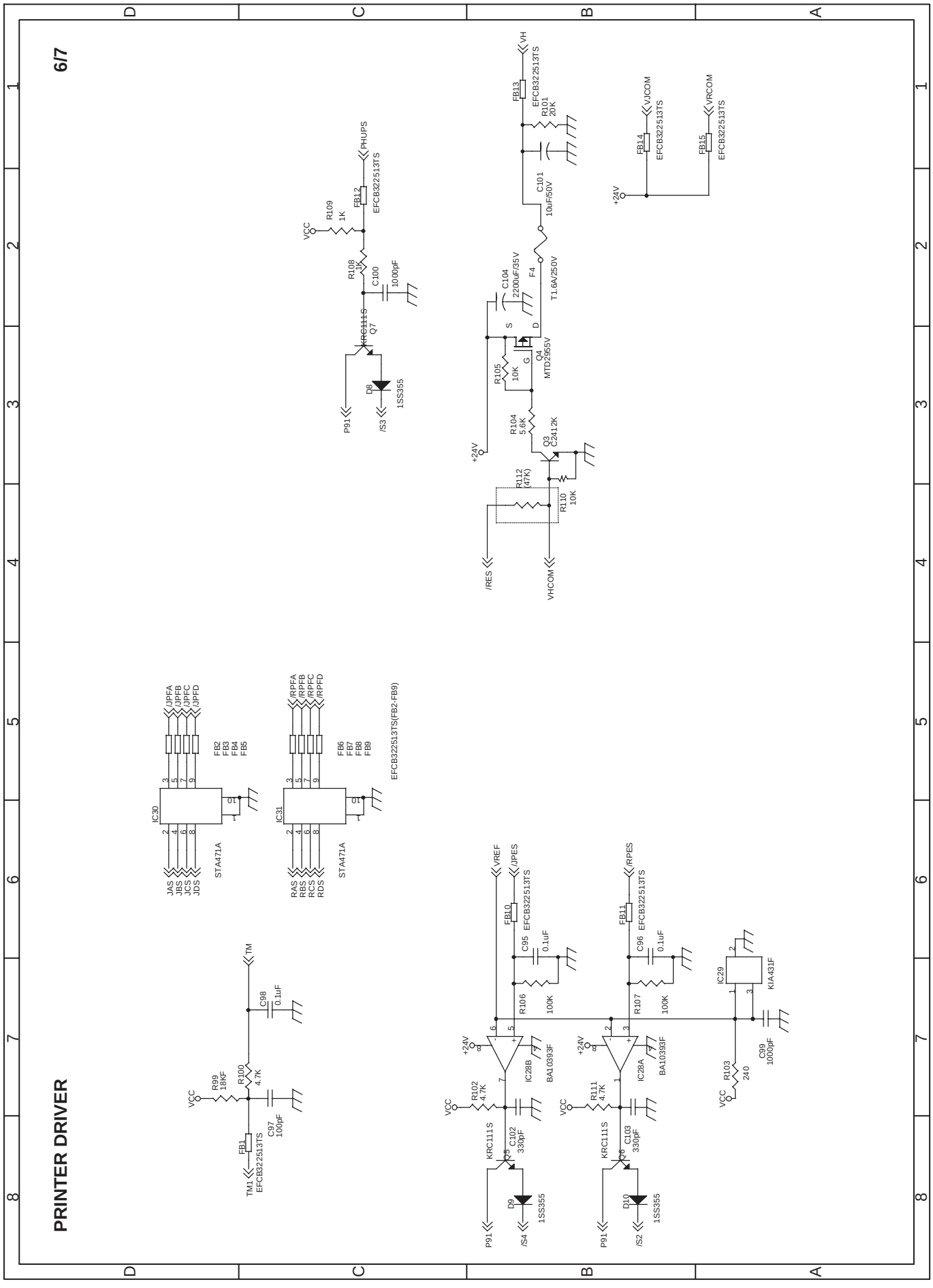


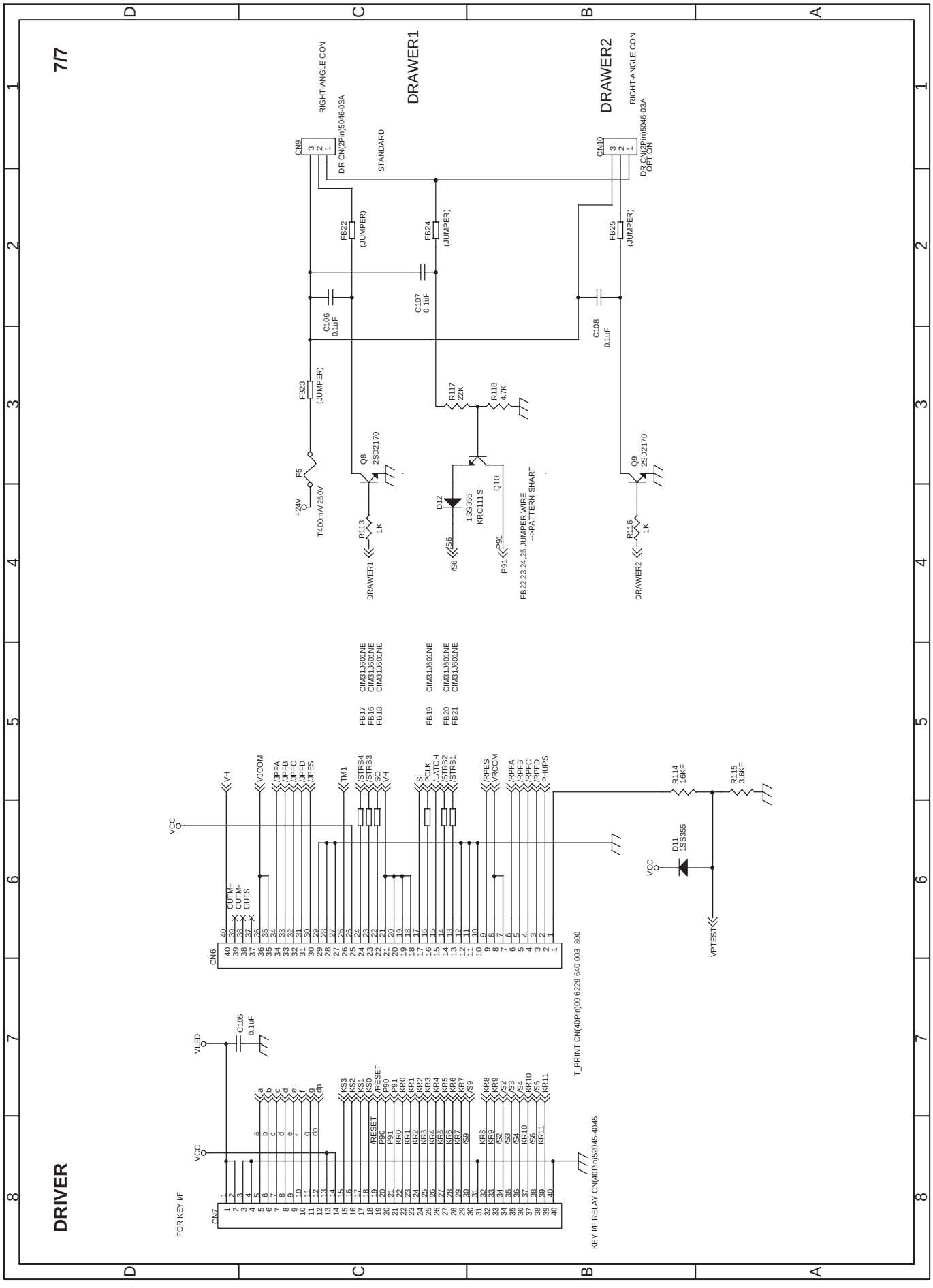

CPU CG
2/7


3/7
FLASH ROM
P-OFF
4M FLASH ROM LH28F004BVT
ROM IC SOCKET(32Pin)
IPL SW SSS312
1 ROM COPY
*IC9 14Pin:VDD 7Pin:GND
D[0..7]
A[0..19]
/WR
/RES
/RD
/POFF
VLED
+24V
IPLON
BA0
BA1
BA23
A19
/CS0


LCD I/F
4/7


5/7
RS232C DRIVER
CN11
CN12
RS232C CN(D-SUB 9Pin)87203-6066
EFCB32513TS X 8
IC32 HIN211
IC33 HIN211
IC34 74HC157DR
*IC34 VCC:16Pin GND:8Pin
SP1 SHORT PIN SHORT SOCKET(CI)
F6 T500mA/ 250V
CI/+5V
VCC
C109 0.1uF
C110 0.1uF
C111 0.1uF
C112 0.1uF
C113 10uF/50V
C114 0.1uF
C115 C116 C117 C118 C119 1000pF*5
C120 0.1uF
C121 0.1uF
C122 0.1uF
C123 0.1uF
C124 10uF/50V
C125 0.1uF
C126 C127 C128 C129 C130 1000pF*5
R119 R120 R121 R122 R123 100ohm*5
R127 R128 R129 R130 R131 100ohm*5
R124 R125 R126 10K
R132 10K
R133 R134 R135 R136 R137 R138 10K
R139 R140 R141 R142 (47K)
Q11 KRC111S
D13 1SS355
/RS1
/ER1
TXD1
RXD1
/CD1
/DR1
/CTS1
/S9
P91
RXD2
/CD2
/CI2
/DR2
/CTS2
/EFTDS
/RS2
/EFTR
/ER2
EFTSD
TXD2
/EFTC

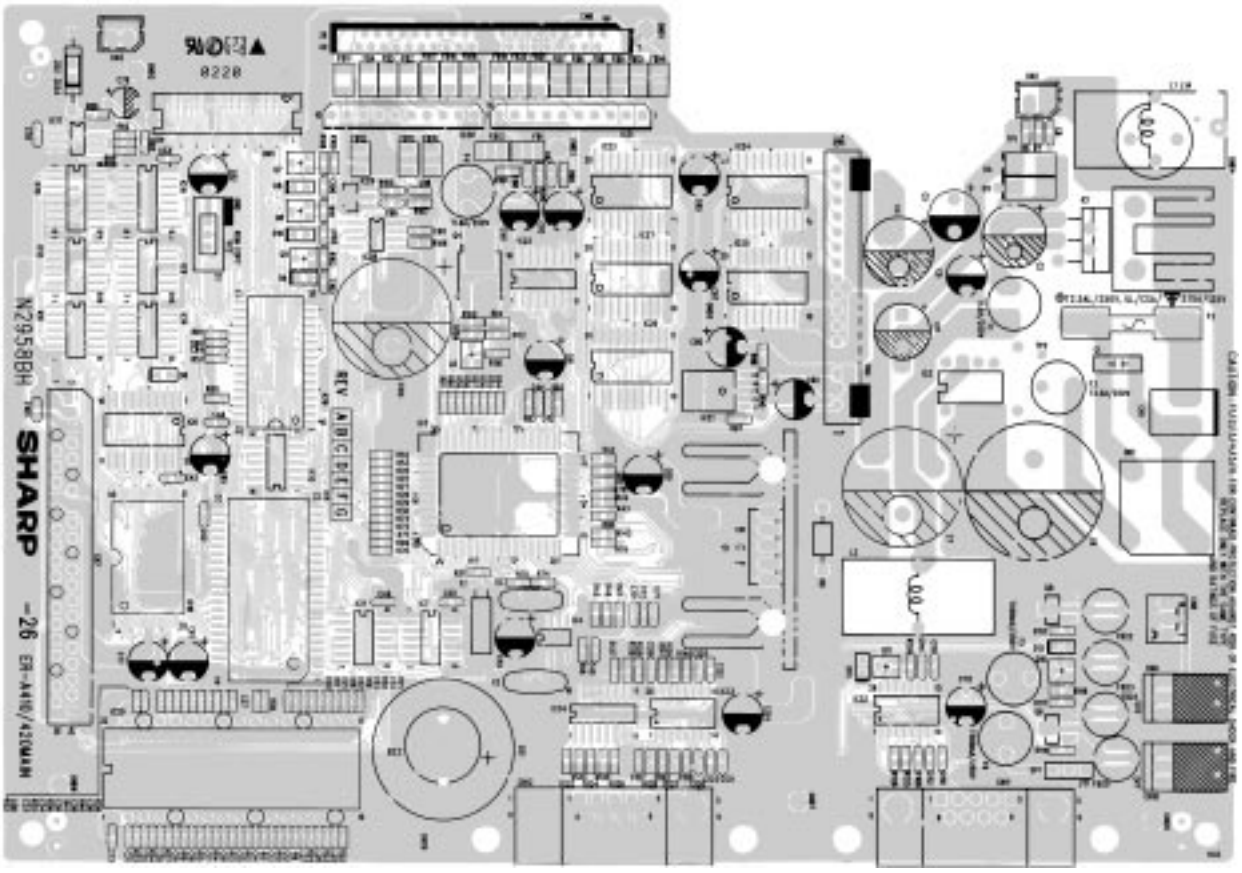

6/7
PRINTER DRIVER
VH
FB13
EFCB322513TS
R101
20K
C101
10uF/50V
VJCOM
FB14
EFCB322513TS
VRCOM
FB15
EFCB322513TS
+24V
PHUPS
FB12
EFCB322513TS
VCC
R109
1K
R108
1K
C100
1000pF
KRC111S
Q7
D8
1SS355
P91
/S3
C104
2200uF/35V
F4
T1.6A/250V
R105
10K
Q4
MTD2955V
S
D
G
R104
5.6K
Q3
C2412K
R112
(47K)
R110
10K
/RES
VHCOM
/JPFA
/JPFB
/JPFC
/JPFD
FB2
FB3
FB4
FB5
IC30
STA471A
JAS
JBS
JCS
JDS
/RPFA
/RPFB
/RPFC
/RPFD
FB6
FB7
FB8
FB9
IC31
STA471A
RAS
RBS
RCS
RDS
EFCB322513TS(FB2-FB9)
TM
C98
0.1uF
R99
18KF
R100
4.7K
C97
100pF
FB1
TM1
EFCB322513TS
VREF
/JPES
FB10
EFCB322513TS
C95
0.1uF
R106
100K
R102
4.7K
C102
330pF
KRC111S
Q5
D9
1SS355
/S4
IC28B
BA10393F
/RPES
FB11
EFCB322513TS
C96
0.1uF
R107
100K
R111
4.7K
C103
330pF
KRC111S
Q6
D10
1SS355
/S2
IC28A
BA10393F
IC29
KIA431F
R103
240
C99
1000pF


DRIVER
7/7
DRAWER1
DRAWER2
RIGHT-ANGLE CON
DR CN(2Pin)5046-03A
STANDARD
OPTION
CN9
CN10
FB22
FB24
FB25
(JUMPER)
C106 0.1uF
C107 0.1uF
C108 0.1uF
FB23
F5
+24V
T400mA/250V
Q8 2SD2170
Q9 2SD2170
R113 1K
R116 1K
R117 22K
R118 4.7K
D12 1SS355 KRC111S
Q10
/S6
P91
DRAWER1
DRAWER2
FB22,23,24,25:JUMPER WIRE
-->PATTERN SHART
FB17 FB16 FB18 CIM31J601NE
FB19 CIM31J601NE
FB20 FB21 CIM31J601NE
CN6
CUTM+
CUTM-
CUTS
VJCOM
VH
TM1
/STRB4
/STRB3
SO
SI
PCLK
/LATCH
/STRB2
/STRB1
/RPES
VRCOM
/RPFA
/RPFB
/RPFC
/RPFD
PHUPS
JPFA
JPFB
JPFC
JPFD
JPFS
VCC
VLED
C105 0.1uF
CN7
FOR KEY I/F
KEY I/F RELAY CN(40Pin)52045-4045
T_PRINT CN(40Pin)00 6229 640 003 800
/RESET
P90
P91
KR0
/KR1
KR2
KR3
KR4
KR5
KR6
KR7
/S9
KR8
KR9
/S2
/S3
/S4
KR10
/S6
KR11
KS3
KS2
KS1
KS0
a
b
c
d
e
f
g
dp
D11 1SS355
R114 16KF
R115 3.6KF
VPTEST

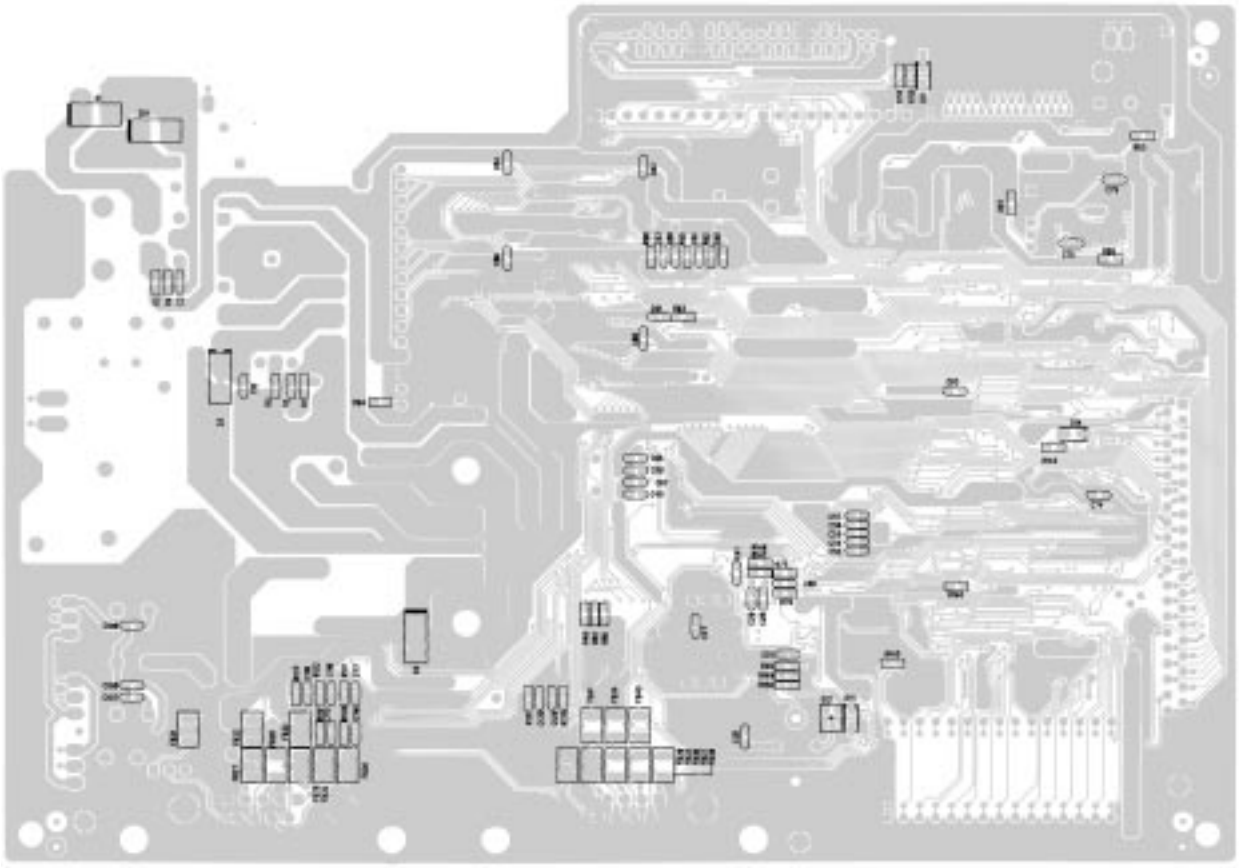
PWB LAYOUT

MAIN PWB

TOP



BOTTOM



SHARP PARTS GUIDE

ER-A410
MODEL ER-A420

PRINTER : PR-45MII

(U,A version)

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Parts marked with "⚠" are important for maintaining the safety of the set. be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

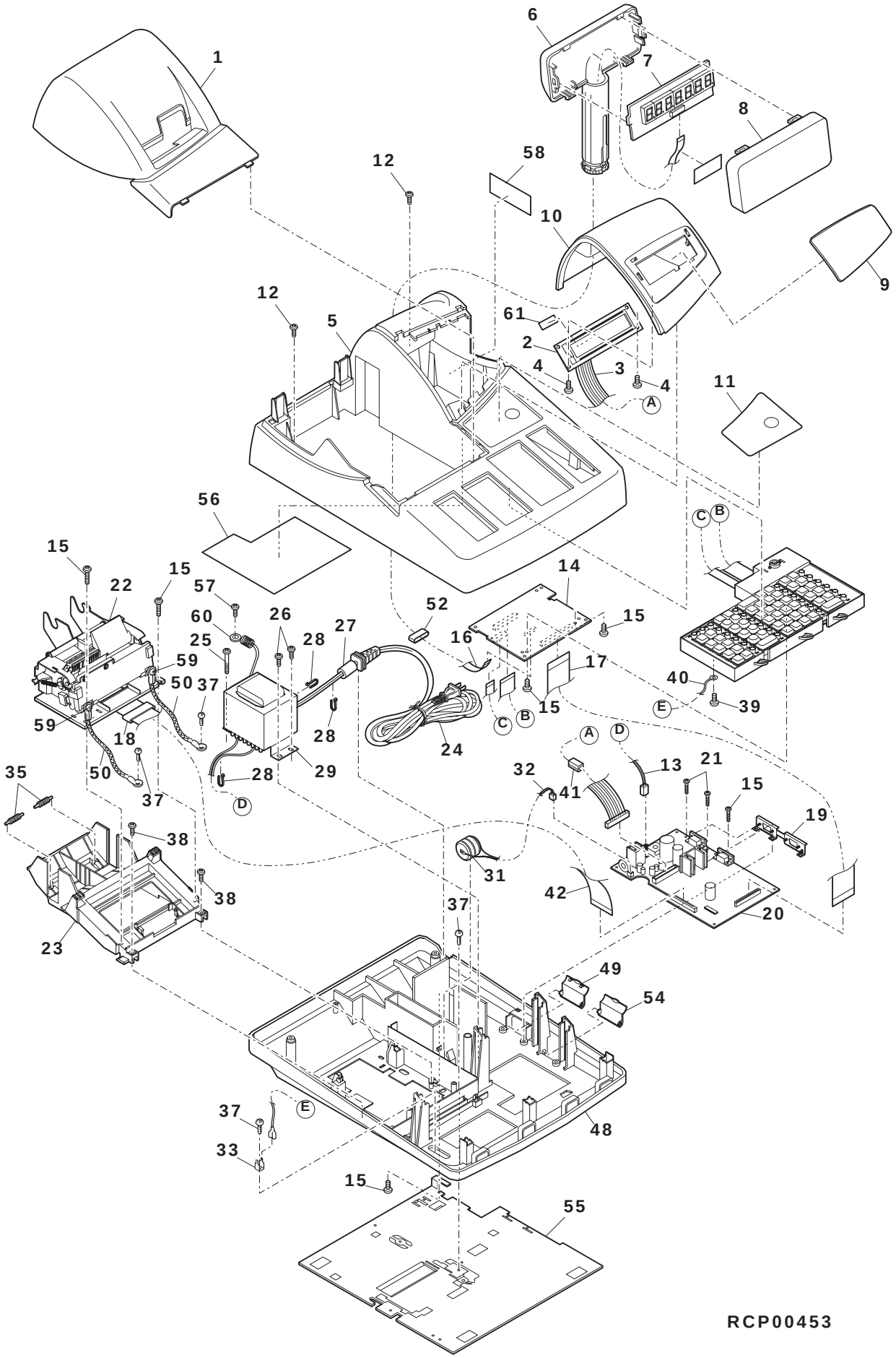
SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCÖVB2525BH02	AX		D	Printer cover unit
2	DUNTK4098BHZZ	BR		E	LCD unit (include No.61)
3	QCNW-3185BHZZ	AW		C	LCD cable
4	XJPSD30P08000	AA		C	Screw(3×8)
5	CCABB2571BHZB	BD		D	Top cabinet [ER-A410]
	GCABB2571BHZF	BD	N	D	Top cabinet [ER-A420]
6	CCABB7861BHSB	AS		D	Pop up cabinet
7	CPWBF2928BH01	BC		E	Pop up PWB unit
8	PFiLW6961BHSi	AQ		D	Pop up filter
9	HPNLH2484BHSB	AY		D	Display panel
10	GCÖVB2526BHSA	AT		D	Display cover
11	HDECP2004BHSH	AL	N	D	Deco panel [ER-A410]
	HDECP2004BHSi	AL	N	D	Deco panel [ER-A420]
12	XBBSC30P06000	AA		C	Screw(3×6)
13	QCNW-3189BHZZ	AK		C	PS cable
14	CPWBF2959BH01	BE		E	Key I/F PWB unit [ER-A410]
	CPWBF2959BH02	BE		E	Key I/F PWB unit [ER-A420]
15	XEBSD30P08000	AA		C	Screw(3×8)
16	QCNW-3186BHZZ	AL		C	Pop up cable
17	QCNW-3188BHZZ	AR		C	Flat cable(40P,1.25mmPitch,MAIN~KEY)
18	RCÖRF2343BHZZ	AR		C	Core(HFP-49.6-6.5-12)
19	LANGT2935BHZA	AL	N	C	RS232C angle
20	CPWBN2958BH02	CB	N	E	Main PWB unit
21	XHBSD30P12000	AA		C	Screw(3×12)
22	Ki-ÖB2017BHZZ	CA		E	Printer unit(PR-45MII)
23	GDAi-2347BHSA	AW		D	Printer stand
⚠ 24	QACCD2002BHZZ	AT		B	AC cord(SP-035)(YELLOW-GREEN)
25	XHBSD40P18000	AB		C	Screw(4×18)
26	XUBSD40P08000	AA		C	Screw(4×8)
27	RCÖRF6695BHZZ	AK		C	Core(OP14A)
28	LBNDJ2003SCZZ	AA		C	Cable band(80M/M)
⚠ 29	RTRNP2436BHZZ	BE		B	Power transformer
⚠ 31	UBATZ6661BHZZ	BA		B	Battery(Ni-MH)
32	QCNW-3187BHZZ	AE		C	Battery cable
33	QTANZ6661BHZZ	AE		C	Faston terminal
35	NRÖLP6651BHSC	AE		C	Paper plate roller
37	XHBSD30P04000	AA		C	Screw(3×4)
38	XEBSD30P12000	AA		C	Screw(3×12)
39	XJPSD30P06000	AA		C	Screw(3×6)
40	QCNW-3202BHZZ	AE		C	GND wire(TOP~BOTTOM)
41	RCÖRF6699BHZZ	AU		C	Core(BNF28)
42	QCNW-3184BHZZ	AS		C	Printer flat cable(40P)
48	GCABA2572BHZL	BD	N	D	Bottom cabinet
49	GCÖVH2530BHSA	AE		D	RS232C cover
50	QCNW-7121RCZZ	AD		C	Printer GND wire
52	RCÖRF2347BHZZ	AL		C	Core(HFP-33)
54	GCÖVH2544BHZZ	AE		D	RS232C cover B
55	LCHSM2009BHZA	AX	N	C	Main chassis
56	PSHEP3006BHZZ	AT		C	Display sheet
57	XBPBZ40P06K00	AA		C	Screw(M4×6K)
58	TCAUZ2002BHZZ	AF		D	Caution label
59	XBPSD30P06K00	AA		C	Screw(M3×6K)
60	QTANP0004BHZA	AE		C	Earth terminal(GP20076-U)
61	VHiHD66710B06	AW		B	IC(HD66710B06)

1 Exteriors



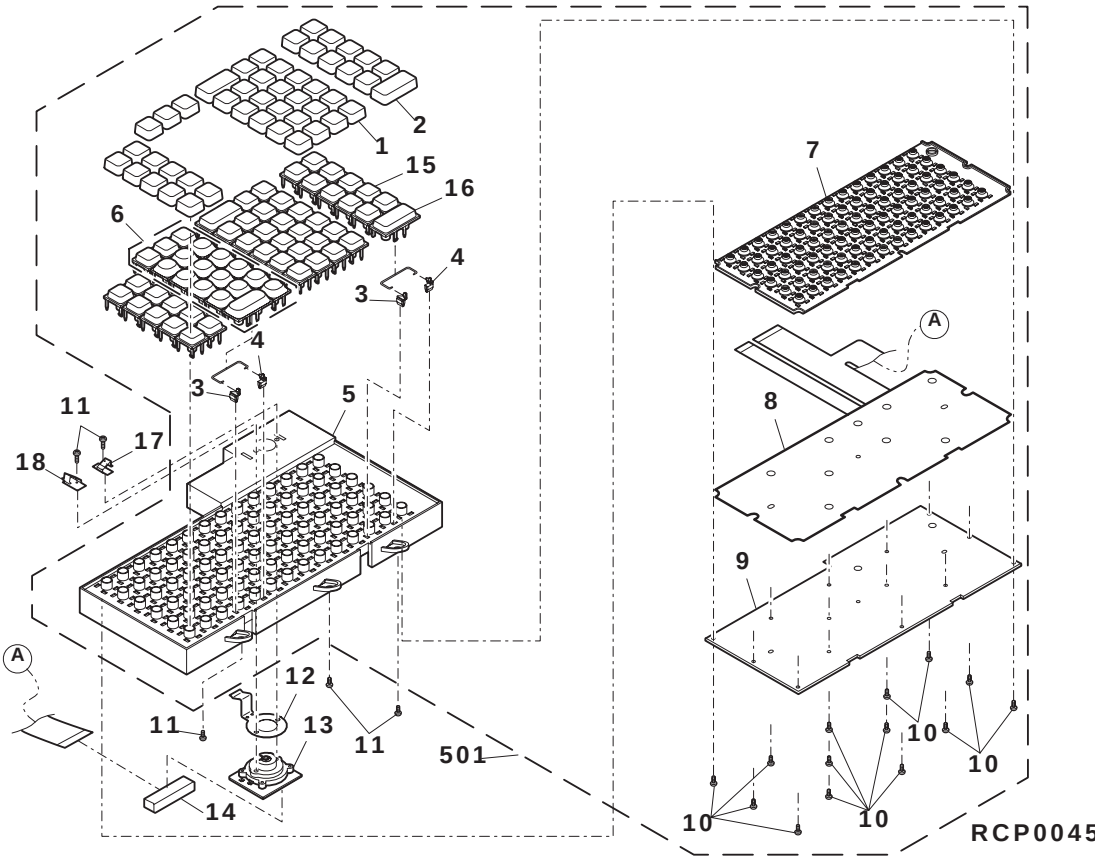
2 Keyboard unit[ER-A410]

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	JKNBZ6897BHSA	AH		C	Key cap(1×1)
2	JKNBZ6899BHSA	AK		C	Key cap(1×2)
3	LHLDZ6837BHZZ	AE		C	Holder L(YELLOW)
4	LHLDZ6836BHZZ	AE		C	Holder R(WHITE)
5	LFRM−2366BHZZ	BC		D	Key frame
6	JKNBZ6905BHZZ	AF		C	Key top(0)
	JKNBZ6908BHZZ	AK		C	Key top(.)
	JKNBZ6911BHZZ	AK		C	Key top(1)
	JKNBZ6912BHZZ	AK		C	Key top(2)
	JKNBZ6913BHZZ	AK		C	Key top(3)
	JKNBZ6914BHZZ	AK		C	Key top(4)
	JKNBZ6915BHZZ	AK		C	Key top(5)
	JKNBZ6916BHZZ	AK		C	Key top(6)
	JKNBZ6917BHZZ	AK		C	Key top(7)
	JKNBZ6918BHZZ	AK		C	Key top(8)
	JKNBZ6919BHZZ	AK		C	Key top(9)
	JKNBZ6920BHZZ	AK		C	Key top(00)
	JKNBZ6907BHZZ	AK		C	Key top(CL)
	JKNBZ6904BHZZ	AK		C	Key top(@/FOR)
7	PGUMM2447BHZZ	BA		C	Key rubber
8	CSHEP2943BHSA	BD		B	Key sheet assy'
9	LPLTM2368BHZZ	AY		C	Keyboard plate
10	XJPSD30P06000	AA		C	Screw(3×6)
11	XEBSD30P08000	AA		C	Screw(3×8)
12	LANGQ7604BHZZ	AG		C	Mode sw angle
13	LKGiW0001BHZZ	AS		B	Mode switch(Body)
14	QCNCM7136BHZZ	AB		C	Connector(MLX 5229-13APB)
15	JKNBZ6896BHZA	AG		C	Key top(1×1)
16	JKNBZ6898BHZZ	AH		C	Key top(1×2)
17	PSHEP3045BHZZ	AE	N	C	mode s/w sheet A
18	PSHEP3046BHZZ	AE	N	C	mode s/w sheet B
101	TLABH2601BHZZ	AY	N	D	Key label
501	Ki−ŌK2021BH01	BP	N	E	Keyboard unit(NORMAL) [include No.1~10,15,16,101]

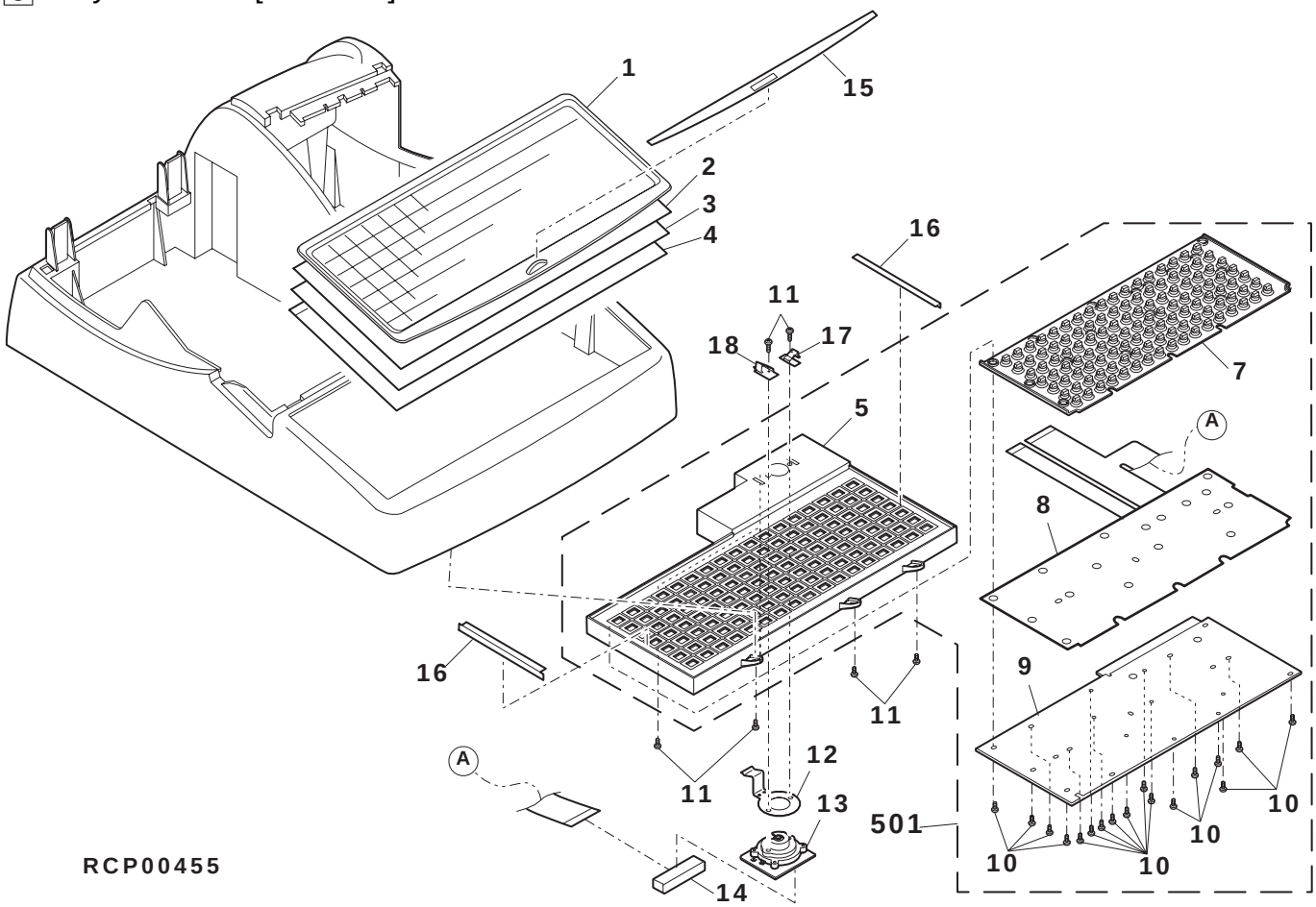
3 Keyboard unit[ER-A420]

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCŌVB2545BHZZ	BD		D	Keycover A
2	PSHEK3015BHZZ	AR	N	C	Standard key sheet
3	PSHEK3028BHZZ	AV	N	C	Text program key sheet
4	GCŌVB2558BHZZ	AY		D	Key cover B
5	LFRM−2369BHZZ	AY		D	Key frame
7	PGUMM2486BHZZ	BB	N	C	Key rubber
8	CSHEP2996BHZZ	BB		C	Key sheet assy'
9	LPLTM2377BHZZ	AU		C	Keyboard plate
10	XJPSD30P06000	AA		C	Screw(3×6)
11	XEBSD30P08000	AA		C	Screw(3×8)
12	LANGQ7604BHZZ	AG		C	Mode sw angle
13	LKGiW0001BHZZ	AS		B	Mode switch(Body)
14	QCNCM7136BHZZ	AB		C	Connector(MLX 5229-13APB)
15	LPLTP2392BHZZ	AY	N	C	Keycover plate
16	LPLTP2378BHZZ	AG	N	C	Keyboard plate
17	PSHEP3045BHZZ	AE	N	C	mode s/w sheet A
18	PSHEP3046BHZZ	AE	N	C	mode s/w sheet B
501	Ki−ŌK2022BHZZ	BH		E	Keyboard unit(FLAT) [include No.5,7~10]

2 Keyboard unit[ER-A410]



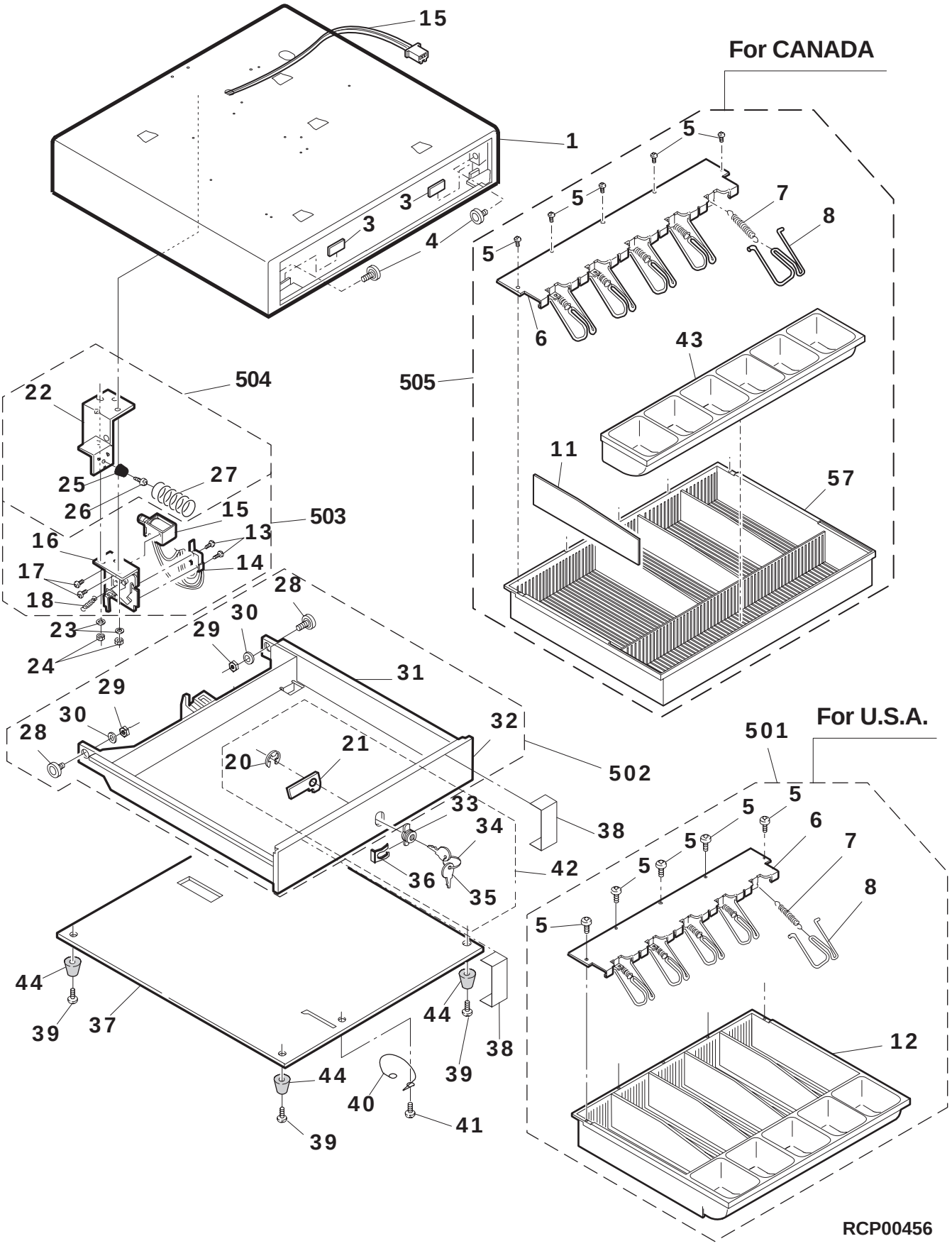
3 Keyboard unit[ER-A420]



4 Drawer box unit(SK-423 type)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CCABM2597BH01	BM	N	D	Cabinet frame unit
3	PGUMM6695BHZZ	AE		C	Stopper gum
4	NRÖLP6650BHZZ	AL		C	Roller
5	XUPSD30P08000	AA		C	Screw(3×8)
6	LBRC−6666BHZZ	AQ		C	Bracket(for 5B)
7	MSPRT6714BHZZ	AE		C	Bill spring
8	MLEVF6695BHZZ	AK		C	Bill lever
11	PSKR−6628BHZZ	AG		C	Separator [A]
12	GCAS−6682BHZZ	AZ		D	Money case(5B/5C) [U]
13	LX−BZ6776BHZZ	AA		C	Screw [FOR MICRO S/W]
14	QSW−M6872BHZZ	AR		B	Micro switch
15	CPLU−1004BHZZ	AZ		B	Solenoid + Drawer cable
16	CFRM−6683BH01	AW		D	Lock frame unit
17	LX−BZ6775BHZZ	AA		C	Screw(3×5) [FOR SOLENOID]
18	MSPRT6713BHZZ	AD		C	Open lever spring
20	XRESJ50−06000	AA		C	E type ring(5mm)
21	MCAMM6633BHZA	AE		C	Lock cam
22	LFRM−6682BHZZ	AN		D	Bell frame
23	XWSSD40−10000	AA		C	Washer
24	XNESD40−32000	AA		C	Nut(M4)
25	PGUMM6696BHZZ	AE		C	Gum leg
26	XHBSD30P12000	AA		C	Screw(3×12)
27	MSPRC6712BHZZ	AF		C	Push out spring
28	NRÖLP6650BHZZ	AL		C	Roller
29	XNESD60−50000	AA		C	Nut(M6)
30	XWSSD60−15000	AA		C	Washer(6mm)
31	GDRW−6680BHZZ	BE		D	Drawer case frame unit
32	GCÖVA7146BHZZ	AV		D	Front cover
33	LKGiW7330BHZZ	AY		B	Lock key (body)
34	PRNGT6637BHZZ	AA		C	Key ring
35	LKGiM7331BHZZ	AE		B	Lock key(1pc)
36	MSPRK6718BHZZ	AF		C	Lock key spring
37	LPLTM6674BH01	AX		C	Bottom plate
38	SPAKA8255BHZZ	AC		D	Paper pad
39	XHBSD40P15000	AA		C	Screw(4×15)
40	MSPRB6711BHZZ	AD		C	Earth spring
41	XHPSC30P08000	AA		C	Screw(3×8)
42	DUNT−1306BHZA	AX		E	Lock key unit
43	GCAS−6691BHZZ	AT		D	Coin case [A]
44	PGUMM6696BHZZ	AE		C	Gum leg
57	GCAS−6690BHZZ	BA		D	Money case [A]
501	CCAS−6682BH01	BF		E	Money case unit(5B/5C) [U]
502	GDRW−6682BHZZ	BH		E	Drawer case unit(for 5B/5C)
503	CLÖK−6683BH10	BM	N	E	Lock unit
504	CFRM−6682BH02	AQ		E	Bell frame unit
505	CCAS−6690BH02	BK		E	Money case unit(5B/6C) [A]
506	CCABM2597BHZZ	BQ	N	D	Cabinet unit (include No.1,3,4)
	(Unit)				
901	GBÖXD2333BHZZ	BZ	N	E	Drawer box unit [U]
	GBÖXD2334BHZZ	BZ	N	E	Drawer box unit [A]

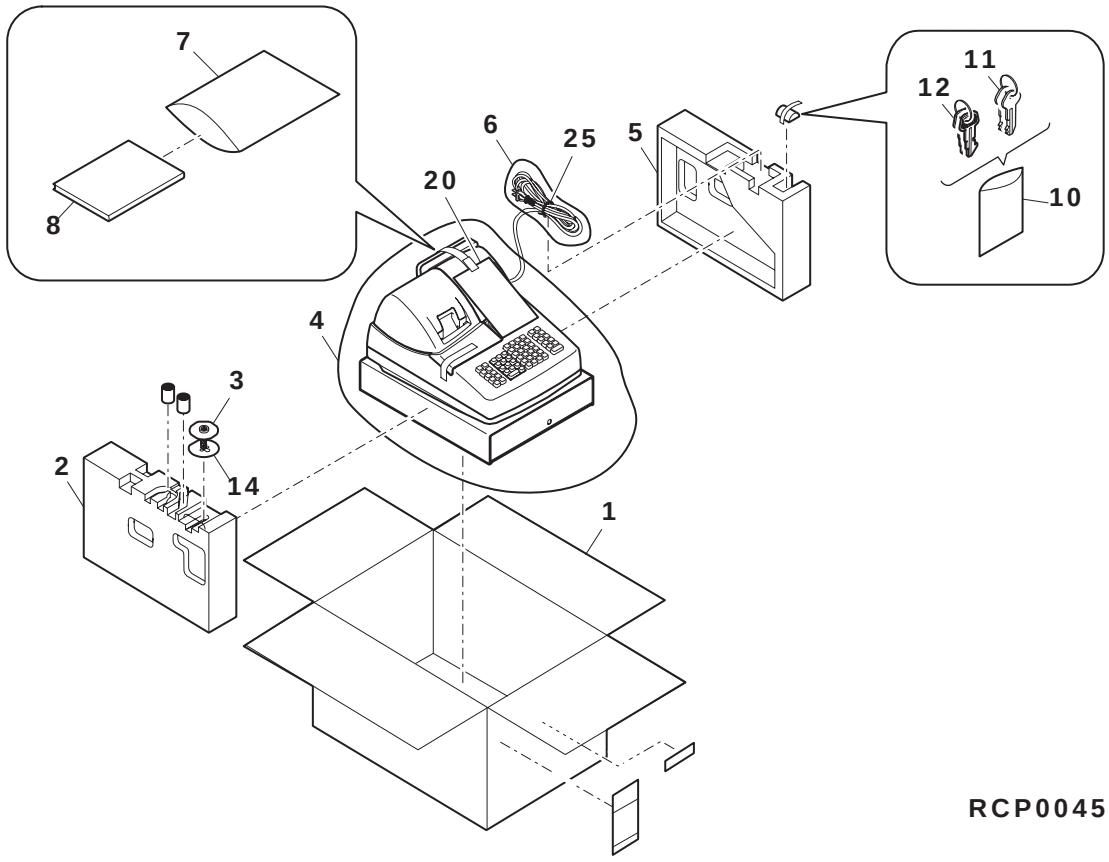
4 Drawer box unit(SK-423 type)



5 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	SPAKC32268BHZZ	BA	N	D	Packing case [ER-A410]
	SPAKC32268BHSA	BA	N	D	Packing case [ER-A420]
2	SPAKA31187BHZL	AS		D	Lacking add L
3	NGERH2317BHZZ	AR		C	Spool
4	PSHEP6681BHZZ	AF		C	Packing sheet
5	SPAKA31187BHZR	AS		D	Packing add R
6	SSAKH4231CCZZ	AA		D	Vinyl bag(140×500mm)
7	SSAKH3015CCZZ	AA		D	Vinyl bag(200×300mm)
8	TiNSE2484BHZZ	AZ	N	D	Instruction book
10	SSAKH3012CCZZ	AA		D	Vinyl bag(80×120mm)
11	LKGiM7331BHZZ	AE		B	Lock key(1pc)
12	LKGiM7110BHZZ	AE		B	MA key(MA)
	LKGiM7111BHZZ	AE		B	OP key(OP)
	LKGiM7129BHZZ	AE		B	SM key(SM)
14	PGiDM2393BHZZ	AF		C	Feed roller
20	TCADH6788BHZA	AC		D	Caution card(Black)
25	UBNDA6630BHZZ	AK		C	AC cord band(4mm×200mm)(Green)

5 Packing material & Accessories



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6 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LX−BZ2189BHZZ	AA		C	Screw [Q1(TR Q1 HEAT SINK)]
2	PRDAF2374BHZZ	AM		C	Heat sink [Q1(KTD998)]
3	PRDAF2381BHZZ	AK		C	Heat sink(PQ1CG2032FZ) [IC1]
4	QCNCM1060AC03	AB		C	Connector(Short Pin 3P) [SP1]
5	QCNCM1101BHZZ	AC		C	Connector(5273-2)(2P) [CN1]
6	QCNCM5278NCZZ	AC		C	Connector(3pin)(5046-03A) [CN9,CN10]
7	QCNCM6879RC1F	AD		C	Connector(16pin) [CN4]
8	QCNCM7125BH0i	AN		C	Connector((9P) MLX 87023-6066)) [CN11,CN12]
9	QCNCM7207BH4J	AQ		C	Connector(40P)(6229ZiF DIP) [CN6]
10	QCNCW1057ACZZ	AB		C	Connector(Short socket) [SP1]
11	QCNCW2946BHZZ	AL		C	Key relay connector(40p)(52045-4045) [CN7]

6 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
12	QCNCW7081BHZZ	AB		C	Connector(2P)(5267-02A)(Blue)	[CN2]
⚠ 13	QFS-B0322QCZZ	AC		A	Fuse(UL125V 3.15A)	[F2]
14	QFSHD2109AFZZ	AC		C	Fuse holder(HD2109AF)	[F2]
⚠ 15	QFS-K2005BHZZ	AF		A	Fuse(LT-5 T400mAL/250V)	[F5]
⚠ 16	QFS-K2007BHZZ	AF		A	Fuse(LT-5,T500mA/250V)	[F6]
⚠ 17	QFS-K2008BHZZ	AF		A	Fuse(LT-5,T2.0A/250V)	[F3]
⚠ 18	QFS-K2009BHZZ	AF		A	Fuse(T1.6A/250V(LT-5)	[F4]
⚠ 19	QFS-K2315BHZZ	AF		A	Fuse(LT5 T1.0AL/250V)	[F1]
20	QSOCZ2042SC32	AE		C	IC socket(32pin)	[IC20]
21	QSW-S0744AFZZ	AG		B	Reset switch(SSS312)	[S1]
22	RALMB6646BHZZ	AQ		B	Buzzer(RALMB6646BHZA)	[BZ2]
23	RC-EZ106ARC1A	AD		C	Capacitor(10WV 10µF)	[C59,C60]
24	RC-EZ2262RC1A	AG		C	Capacitor(22µF/10V)	[C92]
25	RCiLC6653BHZZ	AS		C	Choke coil(180µH)	[L1,L2]
26	RCORF2345BHZZ	AD		C	Chip coil(CIM31J601NE)	[FB16,FB17,FB18,FB19,FB20,FB21]
27	RCORF7002BHZZ	AE		C	Chip core(EFCB322513TS)	[FB11,FB12,FB13,FB14,FB15]
	RCORF7002BHZZ	AE		C	Chip core(EFCB322513TS)	[FB26,FB27,FB28,FB29,FB30,FB31,FB32,FB33]
	RCORF7002BHZZ	AE		C	Chip core(EFCB322513TS)	[FB34,FB35,FB36,FB37,FB38,FB39,FB40,FB41]
	RCORF7002BHZZ	AE		C	Chip core(EFCB322513TS)	[FB1,FB2,FB3,FB4,FB5,FB6,FB7,FB8,FB9,FB10]
28	RCRSP6676RCZZ	AG		B	X-TAL(32.768KHz)	[X1]
29	RCRSZ2400RCZZ	AH		B	X-TAL(12MHz)	[X2]
30	VCCCCY1HH101J	AA		C	Capacitor(50WV 100pF/1608Type/CH)	[C20,C21,C22,C23,C24,C25,C26,C27,C69,C97]
	VCCCCY1HH101J	AA		C	Capacitor(50WV 100pF/1608Type/CH)	[C58,C66,C67,C88,C91,C93,C94]
31	VCCCCY1HH151J	AA		C	Capacitor(50WV 150pF/1608Type/CH)	[C12,C13,C14,C15,C16,C17]
	VCCCCY1HH151J	AA		C	Capacitor(50WV 150pF/1608Type/CH)	[C18,C19,C30,C31,C32]
	VCCCCY1HH151J	AA		C	Capacitor(50WV 150pF/1608Type/CH)	[C33,C34,C35,C36,C37,C38,C39,C44,C45]
32	VCCCCY1HH180J	AA		C	Capacitor(50WV 18pF)	[C28]
33	VCCCCY1HH270J	AA		C	Capacitor(50WV 27PF)	[C29]
34	VCCCCY1HH300J	AB		C	Capacitor(50WV 30PF)	[C40]
35	VCCCCY1HH331J	AB		C	Capacitor(50WV 330pF)	[C53,C54,C55,C56,C57]
	VCCCCY1HH331J	AB		C	Capacitor(50WV 330pF)	[C70,C72,C102,C103,C48]
36	VCEAGA1CW226M	AB		C	Capacitor(22µF/16V)	[C80]
37	VCEAGA1CW337M	AB		C	Capacitor(16WV 330µF)	[C5]
38	VCEAGA1CW476M	AB		C	Capacitor(16WV 47µF)	[C9]
39	VCEAGA1HW106M	AA		C	Capacitor(50WV 10µF)	[C77,C81,C83,C85,C87,C101,C113,C124]
40	VCEAGA1HW107M	AA		C	Capacitor(50WV 100µF)	[C11]
41	VCEAGA1HW228M	AB		C	Capacitor(50WV 2200µF)	[C7]
42	VCEAGA1VW228M	AK		C	Capacitor(2200µF/35V)	[C104]
43	VCEAGD1CW108M	AE		C	Capacitor(16WV 1000µF)	[C4]
44	VCEAGU1HW227M	AC		C	Capacitor(50WV 220µF)	[C2]
45	VCEAGU1HW478M	AL		C	Capacitor(50WV 4700µF)	[C6]
46	VCKYCY1HB102K	AA		C	Capacitor(50WV 1000pF)	[C99,C100,C126,C127,C128,C76]
	VCKYCY1HB102K	AA		C	Capacitor(50WV 1000pF)	[C115,C116,C117,C118,C119,C129,C130]
47	VCKYCY1HB103K	AA		C	Capacitor(50WV 0.01µF/1608Type/B)	[C3]
48	VCKYCY1HF104Z	AA		C	Capacitor(50WV 0.10µF)	[C8,C42,C43,C46,C73,C95,C96,C98,C105,C109]
	VCKYCY1HF104Z	AA		C	Capacitor(50WV 0.10µF)	[C10,C41,C68,C74,C75,C79,C82,C84,C86,C89,C90]
	VCKYCY1HF104Z	AA		C	Capacitor(50WV 0.10µF)	[C106,C107,C108,C47]
	VCKYCY1HF104Z	AA		C	Capacitor(50WV 0.10µF)	[C110,C111,C112,C114,C120,C121,C122,C123,C125]
49	VCQYNA1HM333K	AA		C	Capacitor(50WV 0.033µF)	[C1]
50	VHD1SR159//-1	AF		B	Chip diode(1SR159-200)	[D4,D5]
51	VHD1SS355//-1	AB		B	Diode(1SS355)	[D11,D14,D15]
	VHD1SS355//-1	AB		B	Diode(1SS355)	[D6,D8,D9,D10,D12,D13]
52	VHDCP301///-1	AL		B	Diode(CP301)	[BD1]
53	VHDRB060L//-1	AK		B	Diode(RB060L40)	[D1]
54	VHDRB160L60-1	AF		B	Diode(RB160L-60)	[D2]
55	VHEPTZ6.2A/-1	AH		B	Zener diode(PTZ6.2A)	[ZD1]
56	VHEUDZ5.1B/-1	AC		B	Zener diode(UDZ5.1B)	[ZD2]
57	VHi28F004BV-1	AV		B	4M Flash(LH28F004BVT-TL85)	[IC18]
58	VHi30620SAF-1	BF		B	CPU(M30620SAFP)	[IC3]
59	VHi6284LLT7-1	BN		B	4M S-RAM(HY628400ALLT2-70)	[IC16]
60	VHi74HC138DR/	AK		B	IC(SN74HC138DR)	[IC22]
61	VHiBA00ASFP-1	AR		B	IC(BA00ASFP)	[IC21]
62	VHiBA10393F-1	AC		B	IC(BA10393F)	[IC17,IC28]
63	VHiFS781BZB-1	AP		B	IC(FS781BZB)	[IC4]
64	VHiHC244DWR-1	AK		B	IC(SN74HC244DR)	[IC27]
65	VHiHiN211CA-1	AN		B	IC(HIN211CA)	[IC32,IC33]
66	VHiKiA431F/-1	AK		B	IC(KIA431F)	[IC29]
67	VHiLM2574-ADJ	AU		B	IC(LM2574HVN-ADJ)	[IC2]
68	VHiLV11ANSR-1	AN		B	IC(74LV11)	[IC9]
69	VHiLV138ANS-1	AL		B	IC(74LV138A)	[IC19,IC10]
70	VHiPQ1CG2032F	AL		B	IC(PQ1CG2032FZ)	[IC1]
71	VHiSN74HC245D	AL		B	IC(SN74HC245D)	[IC24,IC26]
72	VHiSN74HC273D	AN		B	IC(74HC273DW)	[IC6]
73	VHiSN74HC374D	AL		B	IC(SN74HC374D)	[IC23,IC25]
74	VHiSNHC157D-1	AK		B	IC(SN74HC157DR	[IC34]
75	VHiSNLV00AS-1	AK		B	IC(74LV00A)	[IC12,IC14,IC13]
76	VHiSNLV27AD-1	AK		B	IC(SN74LV27ADR)	[IC8]
77	VHiSTA471A/-1	AK		B	IC(STA471A)	[IC30,IC31]
78	VRG-ST2EJ100J	AC		B	Fuse resistor(1/4W 10Ω ±5%)	[R8]
79	VRS-CY1JD000J	AA		C	Resistor(1/16W 0Ω ±5%)(Jumper/1608Type)	[R148]

6 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
80	VRS-CY1JD101J	AA		C	Resistor(1/16W 100Ω ±5%) [R25,R26,R27,R28,R29,R30,R52,R53,R127,R128,R129]
	VRS-CY1JD101J	AA		C	Resistor(1/16W 100Ω ±5%) [R119,R120,R121,R122,R123,R130,R131]
81	VRS-CY1JD102F	AA		C	Resistor(1/16W 1KΩ ±1%) [R4]
82	VRS-CY1JD102J	AA		C	Resistor(1/16W 1.0KΩ ±5%) [R108,R109,R113,R116]
83	VRS-CY1JD103F	AB		C	Resistor(1/16W 10KΩ ±1%) [R84]
84	VRS-CY1JD103J	AA		C	Resistor(1/16W 10KΩ ±5%) [R21,R22,R23,R24,R32,R33,R34,R35,R36,R37,R38,R39]
	VRS-CY1JD103J	AA		C	Resistor(1/16W 10KΩ ±5%) [R126,R132,R134,R136,R138]
	VRS-CY1JD103J	AA		C	Resistor(1/16W 10KΩ ±5%) [R71,R72,R73,R78,R81,R97,R105,R110,R124,R125]
	VRS-CY1JD103J	AA		C	Resistor(1/16W 10KΩ ±5%) [R48,R65,R66,R77,R87,R89,R92,R93,R95,R98,R144]
	VRS-CY1JD103J	AA		C	Resistor(1/16W 10KΩ ±5%) [R40,R41,R42,R43,R44,R50,R51,R62,R63,R67,R69,R70]
	VRS-CY1JD103J	AA		C	Resistor(1/16W 10KΩ ±5%) [R9,R10,R11,R12,R13,R14,R15,R16,R17,R18,R19,R20]
85	VRS-CY1JD104J	AA		C	Resistor(1/16W 100KΩ ±5%) [R106,R107]
86	VRS-CY1JD122F	AB		C	Resistor(1/16W 1.2KΩ ±1%) [R2]
87	VRS-CY1JD123J	AA		C	Resistor(1/16W 12KΩ ±5%) [R94,R150]
88	VRS-CY1JD151J	AA		C	Resistor(1/16W 150Ω ±5%) [R7]
89	VRS-CY1JD163F	AA		C	Resistor(1/16W 16KΩ ±1%) [R114]
90	VRS-CY1JD181J	AA		C	Resister(1/16W 180Ω ±5%) [R6]
91	VRS-CY1JD183F	AA		C	Resistor(1/16W 18KΩ ±1%) [R99]
92	VRS-CY1JD203J	AA		C	Resistor(1/16W 20KΩ ±5%) [R101]
93	VRS-CY1JD222J	AA		C	Resistor(1/16W 2.2KΩ ±5%) [R54,R55,R56,R57,R58,R59,R60,R61,R64]
	VRS-CY1JD222J	AA		C	Resistor(1/16W 2.2KΩ ±5%) [R149]
94	VRS-CY1JD223F	AA		C	Resistor(1/16W 22KΩ ±1%) [R1]
95	VRS-CY1JD223J	AA		C	Resistor(1/16W 22KΩ ±5%) [R117]
96	VRS-CY1JD241J	AA		C	Resistor(1/16W 240KΩ ±5%) [R103]
97	VRS-CY1JD242F	AA		C	Resistor(1/16W 2.4KΩ ±1%) [R96]
98	VRS-CY1JD272J	AA		C	Resistor(1/16W 2.7KΩ ±5%) [R83]
99	VRS-CY1JD302F	AA		C	Resistor(1/16W 3KΩ ±1%) [R3]
100	VRS-CY1JD330J	AA		C	Resistor(1/16W 33Ω ±5%) [R74]
101	VRS-CY1JD331J	AA		C	Resistor(1/16W 330Ω ±5%) [R31]
102	VRS-CY1JD332J	AA		C	Resistor(1/16W 3.3KΩ ±5%) [R68]
103	VRS-CY1JD362F	AA		C	Resistor(1/16W 3.6KΩ ±1%) [R115]
104	VRS-CY1JD471J	AA		C	Resistor(1/16W 470Ω ±5%) [R76]
105	VRS-CY1JD472J	AA		C	Resistor(1/16W 4.7KΩ ±5%) [R100,R102,R111,R118]
106	VRS-CY1JD473J	AA		C	Resistor(1/16W 47KΩ ±5%) [R145,R146]
	VRS-CY1JD473J	AA		C	Resistor(1/16W 47KΩ ±5%) [R45,R46,R47,R79,R80]
107	VRS-CY1JD562J	AA		C	Resistor(1/16W 5.6KΩ ±5%) [R90,R104]
108	VRS-CY1JD563J	AA		C	Resistor(1/16W 56KΩ ±5%) [R82]
109	VRS-CY1JD622F	AA		C	Resistor(1/16W 6.2KΩ ±1%) [R88]
110	VRS-CY1JD912F	AA		C	Resistor(1/16W 9.1KΩ ±1%) [R85]
111	VRS-CY2AY392J	AA		C	Resistor(1/10W 3.9KΩ ±5% 1608) [R86]
112	VS2SC2412K/-1	AB		B	Transistor(2SC2412K) [Q3]
	VS2SC2412K/-1	AB		B	Transistor(2SC2412K) [Q12]
113	VS2SD2170//-1	AH		B	Transistor(2SD2170) [Q8,Q9]
114	VSKRC111S//-1	AD		B	Transistor(KRC111S) [Q5,Q6,Q7,Q10,Q11]
115	VSKTD998///-1	AS		B	Transistor(2SD998) [Q1]
116	VSMTD2955V+-1	AQ		B	Transistor(MTD2955V) [Q4]
117	XBPSD30P06000	AA		C	Screw(3×6) [IC1,Q1 (IC1,TR Q1 ???)]
	(Unit)				
901	CPWBN2958BH02	CB	N	E	Main PWB unit

7 Key I/F PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCW2946BHZZ	AL		C	Key relay connector(40p)(52045-4045) [CN1]
2	QCNCW2957BHZZ	AL		C	Connector(KEYBOARD)(12Pin 5597-12CPB) [CN3]
3	QCNCW2958BHZZ	AQ		C	Connector(KEYBOARD)(22Pin 5597-22CPB) [CN4 ER-A410? ??]
4	QCNCW7201BH1E	AK		C	Connector(15P)(52806-1510) [CN2]
5	QCNCW7283BH2F	AS		C	Connector(5597-26CPB) [CN5 ER-A420? ??]
6	RC-KZ1054CCZZ	AB		C	Capacitor(50WV 0.1μF) [C1,C3,C5]
7	VCEAGA1CW106M	AA		C	Capacitor(16WV 10μF) [C2]
8	VCEAGA1CW107M	AC		C	Capacitor(100μF/16V) [C4]
9	VCKYPU1HB101K	AA		C	Capacitor(50WV 100PF)(VCKYPA1HB101K) [C6]
10	VHDDSS133HV-1	AA		B	Diode(DSS133HV) [D1,D2,D3,D4,D5,D6,D7,D8,D9,D10,D11,D12]
	VHDDSS133HV-1	AA		B	Diode(DSS133HV) [D13,JMP(C6?) ER-A420? ??]
11	VHiKiD65083AP	AM		B	IC(KID65083AP) [IC3]
12	VHiSN74HC138N	AL		B	IC(74HC138) [IC1,IC2]
13	VRD-RC2EY121J	AA		C	Resistor(1/4W 120Ω ±5%) [R8,R9,R10,R11,R12,R13,R14]
14	VRD-RC2EY123J	AA		C	Resistor(1/4W 12KΩ ±5%) [R1,R2,R3,R4,R5,R6,R7]
15	VRD-RC2EY473J	AA		C	Resistor(1/4W 47KΩ ±5%) [R15,R16,R17,R18,R19,R20,R21,R22,R23,R24]
16	VSKRA101M//-1	AD		B	Transistor(KRA101M) [Q8,Q9,Q10,Q11,Q12,Q13,Q14]
17	VSKTA1271//-1	AE		B	Transistor(KTA1271)(VS2SA1271-/-1) [Q1,Q2,Q3,Q4,Q5,Q6,Q7]
	VSKTA1271//-1	AE		B	Transistor(KTA1271)(VS2SA1271-/-1) [R25,R26,R27,R28]
	(Unit)				
901	CPWBF2959BH01	BE		E	Key I/F PWB unit [ER-A410]
	CPWBF2959BH02	BE		E	Key I/F PWB unit [ER-A420]

8 Pop UP PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCW7202BH1E	AK		C	Connector(52807-1510) [CN1]
2	VHPD5680GL2-1	AQ		B	LED(2 SEGMENT)(D568GWA) [LED6,LED7,LED8]
3	VHPS5680GL2-1	AP		B	LED(1 SEGMENT)(S568GWA) [LED9]
4	VRD-RC2EY270J	AA		C	Resistor(1/4W 27Ω ±5%) [R1,R2,R3,R4,R5,R6,R7,R8]
	(Unit)				
901	CPWBF2928BH01	BC		E	Pop up PWB unit

9 Articles for consumtion

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	TPAPR6645RC05	AY		S	Roll paper(5rolls/pack)

10 Service options & Special service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LKGiM7113BHZZ	AF		S	Service key
2	GCOVH2541BHZB	AY		S	Water proof switch cover [ER-A420]
3	GCOVH2541BHZA	BC		S	Water proof keyboard cover [ER-A410]
4	GCOVH2541BHSB	BD	N	S	Text preset key cover [ER-A410]
5	PSHEK3008BHZZ	AL		S	Blank sheet [ER-A420]
6	JKNBZ6902BHSB	AH		C	Dummy key(1×1) [ER-A410]
7	JKNBZ6903BHSB	AR		C	Dummy key(1×5) [ER-A410]
8	DKiT-8661BHZZ	BS		S	Key kit(1×1)(Qty:30) (include No101~103)[ER-A410]
9	DKiT-8662BHZZ	BZ		S	Key kit(1×2)(Qty:30) (include No.201~204)[ER-A410]
10	DKiT-8663BHZZ	BU		S	Key kit(2×2)(Qty:10) (include No.301~304)[ER-A410]
11	UKOG-6705RCZZ	BC		S	RS-232 loop back connector
101	TLABH7003BHZZ	AV		D	Key label(1×1) [ER-A410]
102	JKNBZ6897BHSA	AH		C	Key cap(1×1) [ER-A410]
103	JKNBZ6896BHZA	AG		C	Key top(1×1) [ER-A410]
201	LHLDZ6836BHZZ	AE		C	Holder R(WHITE) [ER-A410]
202	LHLDZ6837BHZZ	AE		C	Holder L(YELLOW) [ER-A410]
203	TLABH6999BHZZ	AV		D	Key label(1×2) [ER-A410]
204	JKNBZ6899BHSA	AK		C	Key cap(1×2) [ER-A410]
205	JKNBZ6898BHZZ	AH		C	Key top(1×2) [ER-A410]
301	TLABH7000BHZZ	AV		D	Key label(2×2) [ER-A410]
302	LHLDZ6836BHZZ	AE		C	Holder R(WHITE) [ER-A410]
303	JKNBZ6901BHSA	AN		C	Key cap(2×2) [ER-A410]
304	JKNBZ6900BHZA	AN		C	Key top(2×2) [ER-A410]

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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
【C】					
CCABB2571BHZB	1- 5	BD		D	
CCABB7861BHSB	1- 6	AS		D	
CCABM2597BH01	4- 1	BM	N	D	
CCABM2597BHZZ	4-506	BQ	N	D	
CCAS-6682BH01	4-501	BF		E	
CCAS-6690BH02	4-505	BK		E	
CFRM-6682BH02	4-504	AQ		E	
CFRM-6683BH01	4- 16	AW		D	
CLÖK-6683BH10	4-503	BM	N	E	
CPLU-1004BHZZ	4- 15	AZ		B	
CPWBF2928BH01	1- 7	BC		E	
〃	8-901	BC		E	
CPWBF2959BH01	1- 14	BE		E	
〃	7-901	BE		E	
CPWBF2959BH02	1- 14	BE		E	
〃	7-901	BE		E	
CPWBN2958BH02	1- 20	CB	N	E	
〃	6-901	CB	N	E	
CSHEP2943BHSA	2- 8	BD		B	
CSHEP2996BHZZ	3- 8	BB		C	
【D】					
DKiT-8661BHZZ	10- 8	BS		S	
DKiT-8662BHZZ	10- 9	BZ		S	
DKiT-8663BHZZ	10- 10	BU		S	
DUNT-1306BHZA	4- 42	AX		E	
DUNTK4098BHZZ	1- 2	BR		E	
【G】					
GBÖXD2333BHZZ	4-901	BZ	N	E	
GBÖXD2334BHZZ	4-901	BZ	N	E	
GCABA2572BHZL	1- 48	BD	N	D	
GCABB2571BHZF	1- 5	BD	N	D	
GCAS-6682BHZZ	4- 12	AZ		D	
GCAS-6690BHZZ	4- 57	BA		D	
GCAS-6691BHZZ	4- 43	AT		D	
GCÖVA7146BHZZ	4- 32	AV		D	
GCÖVB2525BH02	1- 1	AX		D	
GCÖVB2526BHSA	1- 10	AT		D	
GCÖVB2545BHZZ	3- 1	BD		D	
GCÖVB2558BHZZ	3- 4	AY		D	
GCÖVH2530BHSA	1- 49	AE		D	
GCÖVH2541BHSB	10- 4	BD	N	S	
GCÖVH2541BHZA	10- 3	BC		S	
GCÖVH2541BHZB	10- 2	AY		S	
GCÖVH2544BHZZ	1- 54	AE		D	
GDAi-2347BHSA	1- 23	AW		D	
GDRW-6680BHZZ	4- 31	BE		D	
GDRW-6682BHZZ	4-502	BH		E	
【H】					
HDECP2004BHSH	1- 11	AL	N	D	
HDECP2004BHSi	1- 11	AL	N	D	
HPNLH2484BHSB	1- 9	AY		D	
【J】					
JKNBZ6896BHZA	10-103	AG		C	
〃	2- 15	AG		C	
JKNBZ6897BHSA	10-102	AH		C	
〃	2- 1	AH		C	
JKNBZ6898BHZZ	10-205	AH		C	
〃	2- 16	AH		C	
JKNBZ6899BHSA	10-204	AK		C	
〃	2- 2	AK		C	
JKNBZ6900BHZA	10-304	AN		C	
JKNBZ6901BHSA	10-303	AN		C	
JKNBZ6902BHSB	10- 6	AH		C	
JKNBZ6903BHSB	10- 7	AR		C	
JKNBZ6904BHZZ	2- 6	AK		C	
JKNBZ6905BHZZ	2- 6	AF		C	
JKNBZ6907BHZZ	2- 6	AK		C	
JKNBZ6908BHZZ	2- 6	AK		C	
JKNBZ6911BHZZ	2- 6	AK		C	
JKNBZ6912BHZZ	2- 6	AK		C	
JKNBZ6913BHZZ	2- 6	AK		C	
JKNBZ6914BHZZ	2- 6	AK		C	
JKNBZ6915BHZZ	2- 6	AK		C	
JKNBZ6916BHZZ	2- 6	AK		C	
JKNBZ6917BHZZ	2- 6	AK		C	
JKNBZ6918BHZZ	2- 6	AK		C	
JKNBZ6919BHZZ	2- 6	AK		C	
JKNBZ6920BHZZ	2- 6	AK		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
【K】					
Ki-ÖB2017BHZZ	1- 22	CA		E	
Ki-ÖK2021BH01	2-501	BP	N	E	
Ki-ÖK2022BHZZ	3-501	BH		E	
【L】					
LANGQ7604BHZZ	2- 12	AG		C	
〃	3- 12	AG		C	
LANGT2935BHZA	1- 19	AL	N	C	
LBNDJ2003SCZZ	1- 28	AA		C	
LBRC-6666BHZZ	4- 6	AQ		C	
LCHSM2009BHZA	1- 55	AX	N	C	
LFRM-2366BHZZ	2- 5	BC		D	
LFRM-2369BHZZ	3- 5	AY		D	
LFRM-6682BHZZ	4- 22	AN		D	
LHLDZ6836BHZZ	10-201	AE		C	
〃	10-302	AE		C	
〃	2- 4	AE		C	
LHLDZ6837BHZZ	10-202	AE		C	
〃	2- 3	AE		C	
LKGiM7110BHZZ	5- 12	AE		B	
LKGiM7111BHZZ	5- 12	AE		B	
LKGiM7113BHZZ	10- 1	AF		S	
LKGiM7129BHZZ	5- 12	AE		B	
LKGiM7331BHZZ	4- 35	AE		B	
〃	5- 11	AE		B	
LKGiW0001BHZZ	2- 13	AS		B	
〃	3- 13	AS		B	
LKGiW7330BHZZ	4- 33	AY		B	
LPLTM2368BHZZ	2- 9	AY		C	
LPLTM2377BHZZ	3- 9	AU		C	
LPLTM6674BH01	4- 37	AX		C	
LPLTP2378BHZZ	3- 16	AG	N	C	
LPLTP2392BHZZ	3- 15	AY	N	C	
LX-BZ2189BHZZ	6- 1	AA		C	
LX-BZ6775BHZZ	4- 17	AA		C	
LX-BZ6776BHZZ	4- 13	AA		C	
【M】					
MCAMM6633BHZA	4- 21	AE		C	
MLEVF6695BHZZ	4- 8	AK		C	
MSPRB6711BHZZ	4- 40	AD		C	
MSPRC6712BHZZ	4- 27	AF		C	
MSPRK6718BHZZ	4- 36	AF		C	
MSPRT6713BHZZ	4- 18	AD		C	
MSPRT6714BHZZ	4- 7	AE		C	
【N】					
NGERH2317BHZZ	5- 3	AR		C	
NRÖLP6650BHZZ	4- 28	AL		C	
〃	4- 4	AL		C	
NRÖLP6651BHSC	1- 35	AE		C	
【P】					
PFiLW6961BHSi	1- 8	AQ		D	
PGiDM2393BHZZ	5- 14	AF		C	
PGUMM2447BHZZ	2- 7	BA		C	
PGUMM2486BHZZ	3- 7	BB	N	C	
PGUMM6695BHZZ	4- 3	AE		C	
PGUMM6696BHZZ	4- 25	AE		C	
〃	4- 44	AE		C	
PRDAF2374BHZZ	6- 2	AM		C	
PRDAF2381BHZZ	6- 3	AK		C	
PRNGT6637BHZZ	4- 34	AA		C	
PSHEK3008BHZZ	10- 5	AL		S	
PSHEK3015BHZZ	3- 2	AR	N	C	
PSHEK3028BHZZ	3- 3	AV	N	C	
PSHEP3006BHZZ	1- 56	AT		C	
PSHEP3045BHZZ	2- 17	AE	N	C	
〃	3- 17	AE	N	C	
PSHEP3046BHZZ	2- 18	AE	N	C	
〃	3- 18	AE	N	C	
PSHEP6681BHZZ	5- 4	AF		C	
PSKR-6628BHZZ	4- 11	AG		C	
【Q】					
QACCD2002BHZZ	1- 24	AT		B	
QCNCM1060AC03	6- 4	AB		C	
QCNCM1101BHZZ	6- 5	AC		C	
QCNCM5278NCZZ	6- 6	AC		C	
QCNCM6879RC1F	6- 7	AD		C	
QCNCM7125BH0i	6- 8	AN		C	
QCNCM7136BHZZ	2- 14	AB		C	
〃	3- 14	AB		C	
QCNCM7207BH4J	6- 9	AQ		C	
QCNCW1057ACZZ	6- 10	AB		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
QCNCW2946BHZZ	6- 11	AL		C	
〃	7- 1	AL		C	
QCNCW2957BHZZ	7- 2	AL		C	
QCNCW2958BHZZ	7- 3	AQ		C	
QCNCW7081BHZZ	6- 12	AB		C	
QCNCW7201BH1E	7- 4	AK		C	
QCNCW7202BH1E	8- 1	AK		C	
QCNCW7283BH2F	7- 5	AS		C	
QCNW-3184BHZZ	1- 42	AS		C	
QCNW-3185BHZZ	1- 3	AW		C	
QCNW-3186BHZZ	1- 16	AL		C	
QCNW-3187BHZZ	1- 32	AE		C	
QCNW-3188BHZZ	1- 17	AR		C	
QCNW-3189BHZZ	1- 13	AK		C	
QCNW-3202BHZZ	1- 40	AE		C	
QCNW-7121RCZZ	1- 50	AD		C	
QFS-B0322QCZZ	6- 13	AC		A	
QFSHD2109AFZZ	6- 14	AC		C	
QFS-K2005BHZZ	6- 15	AF		A	
QFS-K2007BHZZ	6- 16	AF		A	
QFS-K2008BHZZ	6- 17	AF		A	
QFS-K2009BHZZ	6- 18	AF		A	
QFS-K2315BHZZ	6- 19	AF		A	
QSŌCZ2042SC32	6- 20	AE		C	
QSW-M6872BHZZ	4- 14	AR		B	
QSW-S0744AFZZ	6- 21	AG		B	
QTANP0004BHZA	1- 60	AE		C	
QTANZ6661BHZZ	1- 33	AE		C	
【R】					
RALMB6646BHZZ	6- 22	AQ		B	
RC-EZ106ARC1A	6- 23	AD		C	
RC-EZ2262RC1A	6- 24	AG		C	
RCiLC6653BHZZ	6- 25	AS		C	
RC-KZ1054CCZZ	7- 6	AB		C	
RCŌRF2343BHZZ	1- 18	AR		C	
RCŌRF2345BHZZ	6- 26	AD		C	
RCŌRF2347BHZZ	1- 52	AL		C	
RCŌRF6695BHZZ	1- 27	AK		C	
RCŌRF6699BHZZ	1- 41	AU		C	
RCŌRF7002BHZZ	6- 27	AE		C	
RCRSP6676RCZZ	6- 28	AG		B	
RCRSZ2400RCZZ	6- 29	AH		B	
RTRNP2436BHZZ	1- 29	BE		B	
【S】					
SPAKA3187BHZL	5- 2	AS		D	
SPAKA3187BHZR	5- 5	AS		D	
SPAKA8255BHZZ	4- 38	AC		D	
SPAKC3268BHSA	5- 1	BA	N	D	
SPAKC3268BHZZ	5- 1	BA	N	D	
SSAKH3012CCZZ	5- 10	AA		D	
SSAKH3015CCZZ	5- 7	AA		D	
SSAKH4231CCZZ	5- 6	AA		D	
【T】					
TCADH6788BHZA	5- 20	AC		D	
TCAUZ2002BHZZ	1- 58	AF		D	
TiNSE2484BHZZ	5- 8	AZ	N	D	
TLABH2601BHZZ	2-101	AY	N	D	
TLABH6999BHZZ	10-203	AV		D	
TLABH7000BHZZ	10-301	AV		D	
TLABH7003BHZZ	10-101	AV		D	
TPAPR6645RC05	9- 1	AY		S	
【U】					
UBATZ6661BHZZ	1- 31	BA		B	
UBNDA6630BHZZ	5- 25	AK		C	
UKŌG-6705RCZZ	10- 11	BC		S	
【V】					
VCCCCY1HH101J	6- 30	AA		C	
VCCCCY1HH151J	6- 31	AA		C	
VCCCCY1HH180J	6- 32	AA		C	
VCCCCY1HH270J	6- 33	AA		C	
VCCCCY1HH300J	6- 34	AB		C	
VCCCCY1HH331J	6- 35	AB		C	
VCEAGA1CW106M	7- 7	AA		C	
VCEAGA1CW107M	7- 8	AC		C	
VCEAGA1CW226M	6- 36	AB		C	
VCEAGA1CW337M	6- 37	AB		C	
VCEAGA1CW476M	6- 38	AB		C	
VCEAGA1HW106M	6- 39	AA		C	
VCEAGA1HW107M	6- 40	AA		C	
VCEAGA1HW228M	6- 41	AB		C	
VCEAGA1VW228M	6- 42	AK		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCEAGD1CW108M	6- 43	AE		C	
VCEAGU1HW227M	6- 44	AC		C	
VCEAGU1HW478M	6- 45	AL		C	
VCKYCY1HB102K	6- 46	AA		C	
VCKYCY1HB103K	6- 47	AA		C	
VCKYCY1HF104Z	6- 48	AA		C	
VCKYPU1HB101K	7- 9	AA		C	
VCQYNA1HM333K	6- 49	AA		C	
VHD1SR159//-1	6- 50	AF		B	
VHD1SS355//-1	6- 51	AB		B	
VHDCP301///-1	6- 52	AL		B	
VHDDSS133HV-1	7- 10	AA		B	
VHDRB060L//-1	6- 53	AK		B	
VHDRB160L60-1	6- 54	AF		B	
VHEPTZ6.2A/-1	6- 55	AH		B	
VHEUDZ5.1B/-1	6- 56	AC		B	
VHi28F004BV-1	6- 57	AV		B	
VHi30620SAF-1	6- 58	BF		B	
VHi6284LLT7-1	6- 59	BN		B	
VHi74HC138DR/	6- 60	AK		B	
VHiBA00ASFP-1	6- 61	AR		B	
VHiBA10393F-1	6- 62	AC		B	
VHiFS781BZB-1	6- 63	AP		B	
VHiHC244DWR-1	6- 64	AK		B	
VHiHD66710B06	1- 61	AW		B	
VHiHiN211CA-1	6- 65	AN		B	
VHiKiA431F/-1	6- 66	AK		B	
VHiKiD65083AP	7- 11	AM		B	
VHiLM2574-ADJ	6- 67	AU		B	
VHiLV11ANSR-1	6- 68	AN		B	
VHiLV138ANS-1	6- 69	AL		B	
VHiPQ1CG2032F	6- 70	AL		B	
VHiSN74HC138N	7- 12	AL		B	
VHiSN74HC245D	6- 71	AL		B	
VHiSN74HC273D	6- 72	AN		B	
VHiSN74HC374D	6- 73	AL		B	
VHiSNHC157D-1	6- 74	AK		B	
VHiSNLV00AS-1	6- 75	AK		B	
VHiSNLV27AD-1	6- 76	AK		B	
VHiSTA471A/-1	6- 77	AK		B	
VHPD5680GL2-1	8- 2	AQ		B	
VHPS5680GL2-1	8- 3	AP		B	
VRD-RC2EY121J	7- 13	AA		C	
VRD-RC2EY123J	7- 14	AA		C	
VRD-RC2EY270J	8- 4	AA		C	
VRD-RC2EY473J	7- 15	AA		C	
VRG-ST2EJ100J	6- 78	AC		B	
VRS-CY1JD000J	6- 79	AA		C	
VRS-CY1JD101J	6- 80	AA		C	
VRS-CY1JD102F	6- 81	AA		C	
VRS-CY1JD102J	6- 82	AA		C	
VRS-CY1JD103F	6- 83	AB		C	
VRS-CY1JD103J	6- 84	AA		C	
VRS-CY1JD104J	6- 85	AA		C	
VRS-CY1JD122F	6- 86	AB		C	
VRS-CY1JD123J	6- 87	AA		C	
VRS-CY1JD151J	6- 88	AA		C	
VRS-CY1JD163F	6- 89	AA		C	
VRS-CY1JD181J	6- 90	AA		C	
VRS-CY1JD183F	6- 91	AA		C	
VRS-CY1JD203J	6- 92	AA		C	
VRS-CY1JD222J	6- 93	AA		C	
VRS-CY1JD223F	6- 94	AA		C	
VRS-CY1JD223J	6- 95	AA		C	
VRS-CY1JD241J	6- 96	AA		C	
VRS-CY1JD242F	6- 97	AA		C	
VRS-CY1JD272J	6- 98	AA		C	
VRS-CY1JD302F	6- 99	AA		C	
VRS-CY1JD330J	6-100	AA		C	
VRS-CY1JD331J	6-101	AA		C	
VRS-CY1JD332J	6-102	AA		C	
VRS-CY1JD362F	6-103	AA		C	
VRS-CY1JD471J	6-104	AA		C	
VRS-CY1JD472J	6-105	AA		C	
VRS-CY1JD473J	6-106	AA		C	
VRS-CY1JD562J	6-107	AA		C	
VRS-CY1JD563J	6-108	AA		C	
VRS-CY1JD622F	6-109	AA		C	
VRS-CY1JD912F	6-110	AA		C	
VRS-CY2AY392J	6-111	AA		C	
VS2SC2412K/-1	6-112	AB		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VS2SD2170//-1	6-113	AH		B	
VSKRA101M//-1	7- 16	AD		B	
VSKRC111S//-1	6-114	AD		B	
VSKTA1271//-1	7- 17	AE		B	
VSKTD998///-1	6-115	AS		B	
VSMTD2955V+-1	6-116	AQ		B	
【X】					
XBBSC30P06000	1- 12	AA		C	
XBPBZ40P06K00	1- 57	AA		C	
XBPSD30P06000	6-117	AA		C	
XBPSD30P06K00	1- 59	AA		C	
XEBSD30P08000	1- 15	AA		C	
〃	2- 11	AA		C	
〃	3- 11	AA		C	
XEBSD30P12000	1- 38	AA		C	
XHBSD30P04000	1- 37	AA		C	
XHBSD30P12000	1- 21	AA		C	
〃	4- 26	AA		C	
XHBSD40P15000	4- 39	AA		C	
XHBSD40P18000	1- 25	AB		C	
XHPSC30P08000	4- 41	AA		C	
XJPSD30P06000	1- 39	AA		C	
〃	2- 10	AA		C	
〃	3- 10	AA		C	
XJPSD30P08000	1- 4	AA		C	
XNESD40-32000	4- 24	AA		C	
XNESD60-50000	4- 29	AA		C	
XRESJ50-06000	4- 20	AA		C	
XUBSD40P08000	1- 26	AA		C	
XUPSD30P08000	4- 5	AA		C	
XWSSD40-10000	4- 23	AA		C	
XWSSD60-15000	4- 30	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	

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